A Lecture
ON
HYDROCEPHALUS.
A STUDY IN PHYLOGENY AND PATHOLOGY.

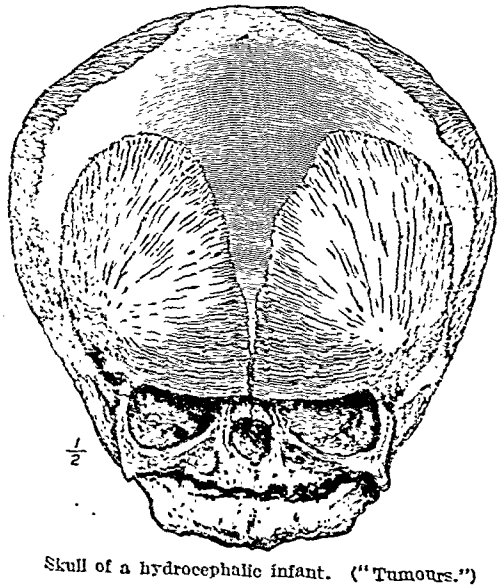
Being the Opening Lecture at St. George's Hospital Medical School on Oct. 1st, 1928,

BY SIR JOHN BLAND-SUTTON, BART., F.R.C.S. ENG.

HYDROCEPHALUS is a convenient Greek compound word signifying a watery head. The skulls of hydrocephalic infants litter the shelves of our museums and dismal bills of mortality do not furnish a true estimate of the frequency of this condition. The orifice through which the fœtus is impelled in order to be born is not sufficiently accommodating to allow the enlarged head to escape serious damage, and on the museum shelves these expanded skulls lie like so many withered buds!

Congenital hydrocephalus is due to an abnormal accumulation of fluid in the ventricles of the brain. In typical examples, the large size of the cranium and the smallness of the face are in striking contrast. The gradual increase of the fluid within the ventricles distends them causing wide separation of the cranial bones, while the bones of the face retain their natural proportions and relations to each other. The halves of the frontal bones are widely separated from each other; the spaces between the parietals, and between these and the occipital are wider than usual (Fig. 1). Indeed, the bones of the cranial vault are so disparted while those of the skull-base retain their usual juxta-

FIG. 1.



Skull of a hydrocephalic infant. ("Tumours.")

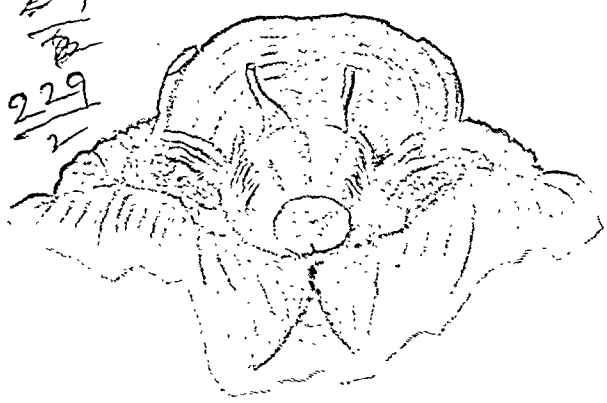
position, that the bones in the vault of a hydrocephalic skull were compared by Trousseau to the petals of an opening flower.

THE LATERAL RECESSES OF THE FOURTH VENTRICLE.

Previous to the publication of the "Origin of Species" (1859), and particularly the "Descent of Man" (1871), rudimentary organs in man's body were regarded by anatomists as curiosities. Many were known. They were galvanised into life by Darwin's conception of the Descent of Man. Human anatomy soon convinced me of the light evolution shed on rudimentary organs—*Vestiges.*

In 1879, while engaged at the Middlesex Hospital in preparing specimens of the brain for teaching purposes, my attention was arrested by a tuft of choroid plexus on each side of the cerebellum immediately adjacent to the flocculus. At that date no reference was made to these tufts in English text-books of anatomy (Fig. 2); they mark the orifices of *the lateral recesses of the fourth ventricle of the brain.* They were described in 1849 by Bochdalek, Professor of Anatomy in Prague, who likened them to a basket

FIG. 2.



Under surface of the pons and medulla showing tufts of choroid *plexus peering from the orifices of the lateral recesses.* (Henle.)

of flowers—"Blumenkorbschen," or fullhorn (cornucopia). For many years anatomists took little notice of them.

When a brain is carefully hardened in alcohol and divided transversely through the pons and the cerebellum, so as to include the lateral recesses, the anatomist at once recognises that the tufts which form the flowers in Bochdalek's "Blumenkorbschen" are continuous with the choroid plexus covering the roof of the fourth ventricle, and that the wall of the recess is in contact with the auditory nerve (Fig. 3).

The orifice of each lateral recess is in contact with a depression on the inner wall of the petrous portion of the temporal bone which lodges the bulbous end of the endolymphatic duct. In 1884 I drew attention to this relationship and have for many years sought to find out its meaning. It is brimful of interest as I will endeavour to explain.

The brain and spinal cord are originally a tube of epiblast of which the anterior end consists of three inter-communicating bulbs—the three primary vesicles. These vesicles are represented in the adult brain by the third ventricle, the aqueduct of Sylvius, and the fourth ventricle, which is in direct communication with the central canal of the spinal cord. The paired lateral ventricles of the adult brain are out-growths from the first primary vesicle. (Fig. 4.)

The third vesicle concerns us for the moment—its floor thickens; its cavity becomes rhomboidal and it is recognised in the adult brain as the fourth ventricle. Its roof remains as a thin lamina—the velum. Chorionic villi sprout from the ventricular surface of the velum. There are no observations which enable us to fix the date when the lateral angles of this rhomboid ventricle burst into the subarachnoid space; probably this happens when the chorionic villi become active, and the pressure of the fluid within it makes vents through the two least resisting parts of its walls.

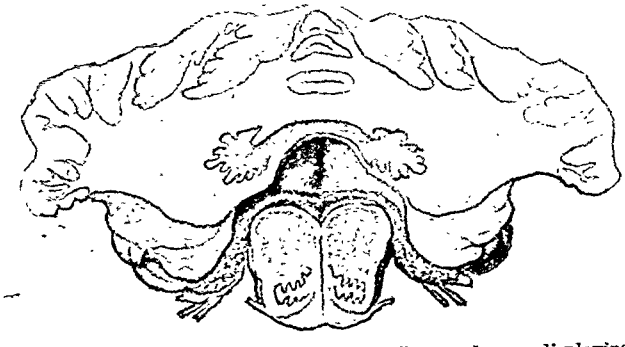
THE CHOROID PLEXUS AND THE VENTRICULAR FLUID.

The cerebro-spinal fluid is secreted by the choroid plexus and fills all the cavities of the brain; it escapes through the lateral recesses into the subarachnoid spaces. The manner of its escape from these spaces is not understood, but it is inferred that the fluid is absorbed by the veins and is discharged into the venous sinuses of the dura.

The choroid plexus is active about the fourth month of intra-uterine life, and if the escape of the fluid from the ventricle is hindered, the cavities of the brain above the blockade are dilated by the pressure of the accumulated fluid (Fig. 5). Obstruction to the escape of the ventricular fluid produces an effect on the brain parallel to that which occurs in a kidney when the urine is hindered from escaping from the ureter, and known as hydronephrosis.

Congenital hydrocephalus and congenital hydronephrosis are parallel conditions; they arise during intra-uterine life. The epithelium of the kidney and

FIG. 3.



Transverse section through the cerebellum and pons displaying the lateral recesses of the fourth ventricle and their relation to the auditory nerve. (Henle.)

the choroid plexuses of the brain are active about the fourth month of intra-uterine life.

The choroid plexuses perform a similar function for the brain which the renal epithelium exercises for the body generally. These plexuses may be styled cerebral kidneys, but with this difference: urine is collected in a bladder from which it is expelled intermittently. Cerebro-spinal fluid is in some measure reintroduced into the blood. Urine is noxious to blood.

The function of the cerebro-spinal fluid is ill-understood; its excessive accumulation and retention in the ventricles of the brain does not induce toxic symptoms. It is the pressure of a gross quantity which leads to disaster. The unrestrained escape of this fluid is fatal to children; there is strong clinical evidence that it has a definite toxicity for the rest of the body, for when liberated into the tissues, high fever is apt to occur during the short period before its absorption is arrested by the inevitable reaction in the tissues that produces encystment (Trotter).

Complete obstruction of the interventricular communications is as inimical to life as complete obstruction to both ureters.

The embryology of the brain clearly indicates that the primary vesicles form a closed sac; the lateral recesses are pouchings from the third vesicle and their communication with the subarachnoid area is a secondary event. If the lateral recesses fail to open into the subarachnoid space, the ventricular fluid is retained and leads to dilatation of all the ventricular cavities of the brain; this brings congenital hydrocephalus, due to imperforate lateral recesses, into line with fœtal hydronephrosis.

In order to appreciate the evolutionary significance of the lateral recesses, it is necessary to examine the auditory capsule in the cartilaginous stage of the skull.

THE HUMAN CHONDROCRANIUM.

At the time I began to study the significance of the ateral recesses, I was also concerned with man's skull in its cartilaginous condition (Fig. 6). This figure I prepared for my article on Osteology in Morris's "Human Anatomy," 1893.

On the inner face of the periotic cartilage there is a discrete orifice posterior to the internal auditory meatus: it is known as the aqueductus vestibuli, and ... duct which ends as a bulb, or sac, under the dura. The orifice of e lateral recess of the fourth ventricle lies in con with this bulb. From a careful consideration of anatomical proximity I felt sure that some intin relationship was indicated between the ventric fluid of the brain and the endolymph of the labyri

THE AUDITORY ORGAN AND ITS LABYRINTH

The periotic capsule contains the organ of hea and equilibration. This organ, like the cer nervous tube is epiblastic in origin; it arises as a l which becomes deeply embedded in adjacent m blastic and sinks into close association, but wit communicating, with the third cerebral vesicle. auditory bulb gives origin to the saccule, ut cochlea, and three semicircular canals—all ho structures filled with fluid—endolymph. The w is known as the labyrinth.

The complex system in some vertebrates—Ela branch fishes—retains relations with the ext by means of the endolymphatic duct (Fig. 7). fluid in this labyrinth of canals and saccules is aff by vibrations of air and water, and by alteratio the position of the head. The labyrinth is conce with hearing and with equilibration.

A comparison of the chondrocranium of man the cranium of a cartilaginous fish is instruc In such fishes the semicircular canals are big and e seen in the translucent cartilage. The endoly in the canals comes into relation with the wat which these fishes live, merely separated fro by skin (Fig. 7); it is easily affected by vibratio the water and by alteration in the position of the The significance of these facts is obvious: the of the auditory capsule which lodges the bulb c ductus endolymphaticus is in close relationship the orifice of the lateral recess.

For nearly 50 years I have sought for an anato relationship between the ventricular cavities o

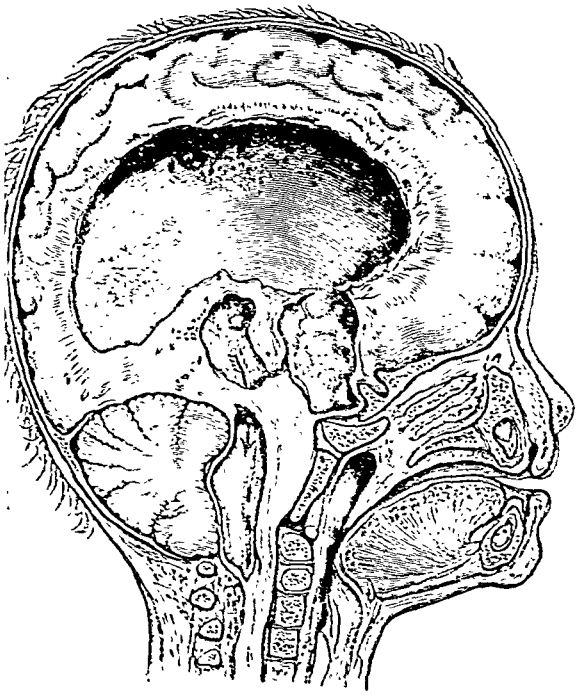
FIG. 4.

Diagram of a mammalian brain in section showing its ve and the choroid plexuses. ("Tumours.")

brain and the ear-labyrinth, believing that the lay through the lateral recesses of the fourth ven My forecast has been recently demonstrated. Alexander in 1927 studied the lateral recesses embryo dog-fish. He discovered that at the where the lateral recess comes in contact wit inner wall of the skull-capsule, the cartilage, else thick, is reduced to a thin connective-tissue mem which seems as though stretched between two ridges. One side of this membrane is covered a continuation of the epithelium of the lateral r on the other side it is covered with the epitheli the labyrinth-vesicle. Thus the walls of the lymphatic cavity and the fourth ventricle separated only by a thin tense membrane (Fig.

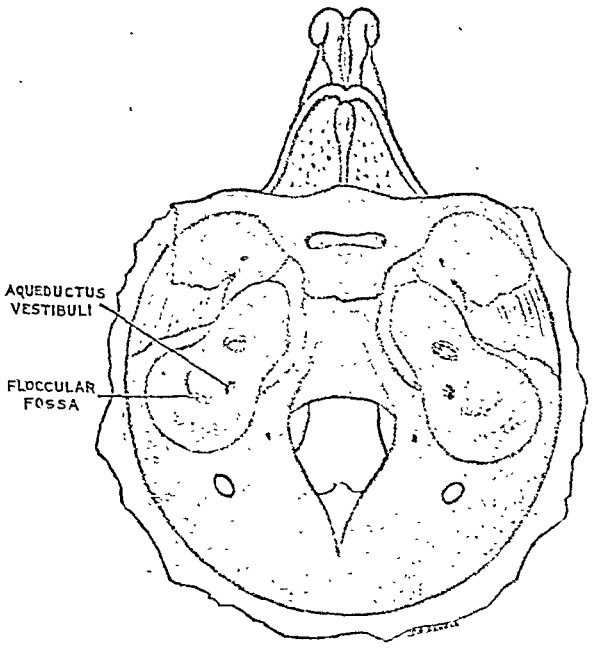
In nearly all vertebrates the internal ear into relation with the subarachnoid space th the ductus endolymphaticus. In the mu *Protopterus* the roof of the fourth ventricle is laid by the saccus endolymphaticus. Alexa researches led him to this expression: "Der re lateralis ist ein phylogenetisch altes Organ." Wi I agree.

FIG. 5.



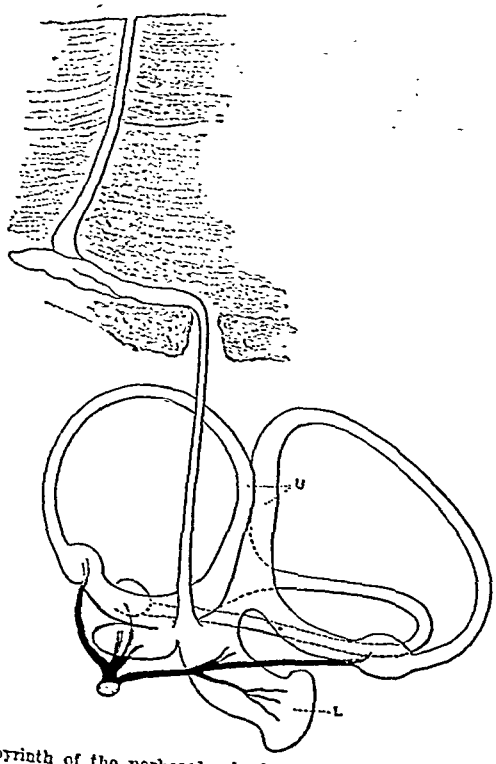
agittal section of a child's head the subject of hydrocephalus. The point of the arrow is in the fourth, the nock and feathers in the third ventricle. The infundibulum is widely dilated and the pituitary fossa expanded. ("Tumours.")

FIG. 6.



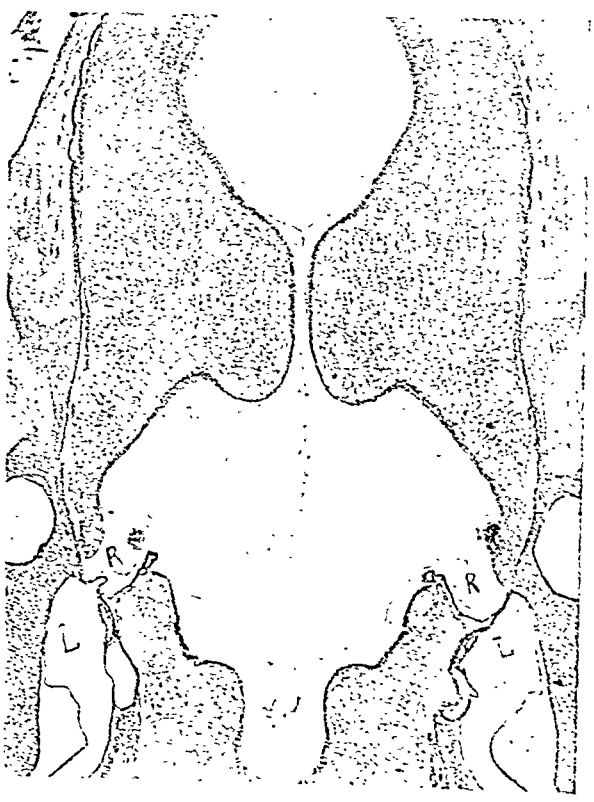
Human chondrocranium × 4, third month. The periotic cartilage is easily identified; also the auditory meatus; and the floccular fossa; and the aqueductus vestibuli. In adult skulls this orifice is overhung by a thin lip of bone which indicates the grave of the endolymphatic sac.

FIG. 7.



abyrinth of the porbeagle shark. U. Portion of the utricle. L. Lagena. (Cat. Mus. Roy. Coll. of Surgeons.)

FIG. 8.



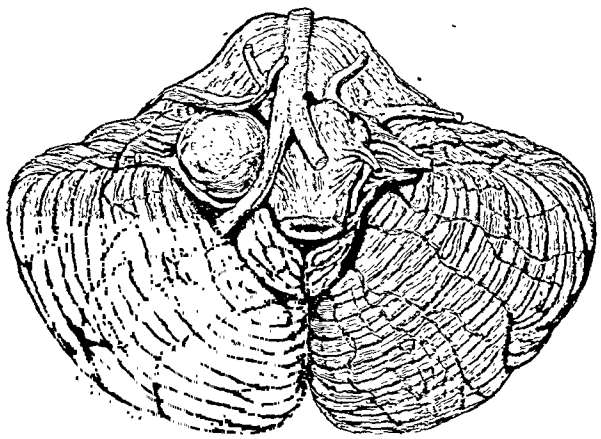
Section of the brain of a dog-fish embryo showing the lateral recess R, and the labyrinth L, in intimate contact. (L. Alexander.)

PATHOLOGY: THE RELATION OF THE LATERAL RECESSES TO HYDROCEPHALUS.

It has been known for many years that the orifice of a lateral recess may be occluded and the fluid within the fourth ventricle will distend it into a globular sac. I observed and described such a cyst in 1886 and found other examples recorded, some of which were called "hydroceles of the fourth ventricles." Alexander has carefully studied them in the Neurological Institute, Vienna, and finds them frequent. In a fair proportion of cases they are associated with definite local pathological signs, connected with the auditory nerve which may be involved in the cyst-wall (Fig. 9).

A study of the embryology of the brain makes it clear that the lateral recesses may be occluded, or remain imperforate in fœtal life. This is of serious consequence to the fœtus, for the cerebellum remains rudimentary or may fail to develop. In such an

FIG. 9.



Inferior surface of the cerebellum showing an occluded and dilated lateral recess. The opposite recess is also occluded but not dilated. From a man aged 29.

event the fourth ventricle is represented as a sac bulging through the median gap of the squamo-occipital. The cyst is then called an occipital meningocele.

In such conditions the observer reports the cerebellum as rudimentary. Cleland in 1883 described it in a different way: the supposed cerebellum is the flocculus. I believe this. The flocculus is developed from the foremost part of the third primary vesicle. An occipital meningocele may be defined as hydrocephalus limited to the fourth ventricle.

The main thesis of this lecture can be shortly expressed:—

Many examples of congenital hydrocephalus are due to prenatal bilateral occlusion of the lateral recesses of the fourth ventricle.

In the embryo the fourth ventricle is a closed sac; in the course of development the recesses arise as pouches. If they remain imperforate, the ventricular fluid secreted by the choroid plexus has no outlet into the subarachnoid spaces, and the sequence is hydrocephalus. The recesses may be formed and become occluded in postnatal life, and hydrocephalus ensue. It follows as a corollary that otologists, keenly interested in what may be called labyrinthine disturbances, will boldly attempt to relieve them by exposure and puncture of the endolymphatic sac. This will afford opportunity for noticing the condition of the orifice of the adjacent lateral recess. Here is a field for surgical enterprise! This lecture may stimulate surgeons to relieve hydrocephalus, not by tapping the lateral ventricles through the vault of the skull, but by incising the lateral recesses at its base!

Apart from surgical enterprise, this investigation adds another vestige in man's complex body to the list of phylogenetic organs which lead to pathological changes of vital importance.

HISTORICAL.

A cyst involving the orifice of a lateral recess of the fourth ventricle was described by Virchow in *Die Krankhaften Geschwülste*, 1863. The cyst was as big as a ripe cherry; it pressed on the flocculus and the facial nerve; remnants of the choroid plexus of the fourth projected into the cyst. Though the walls of the cyst were thin its pressure had caused paralysis of the facial nerve. Virchow named it Hydrocele ventriculi.

Recklinghausen in 1864 described a bilateral example, but no one seems to have associated the condition with the "lateral recesses" until my observations were published in *Brain*, 1887. Luschka gets credit for discovering the orifices of the lateral recesses, and they are called by writers to-day *Luschka's foramina*.

My views on the foramen of Magendie are briefly set out in my book, "Orations and Addresses," 1924, p. 135. The French physiologist was ignorant of the existence of the orifices of the lateral recesses.

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A CRITICAL INVESTIGATION OF THE VALUE OF IMMUNE SERA IN THE PROPHYLAXIS OF MEASLES.

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OF the many problems which confront the adminis tration of fever hospitals and other institutions wher many children are treated, there is none more harassin than the outbreak of an infectious disease in th wards. It not infrequently happens that a patien admitted to hospital with one disease may contract second, or even a third, before being discharged. Nc only does the concurrence of two diseases render th patient more prone to the complications and sequel peculiar to each disease, but the necessity of puttin the wards in quarantine seriously interferes with th output of the institution, and entails great econom loss both to the individual and to the hospital author ties. The infectious fevers most likely to occur a those which tend to assume epidemic proportior and in which the incubation period is relatively lon Both conditions are present in measles, which, i consequence, is responsible for more "cross-infection than any other infectious disease. Moreover, accordir to MacNalty,[1] there is statistical evidence that measl is particularly severe when it attacks children who a closely aggregated in hospitals, the fatality being muc above the average. Prompt isolation, which contro most outbreaks, is almost useless for measles. Thu if a ward of susceptible patients has been exposed infection by an early case of measles, even for a fe hours, further cases follow in due course almo invariably. Zingher[2] states that 96 to 98 per cen

of susceptibles develop the disease if exposed to it. Attempts to arrest the spread of infection have been made by various means,[3] notably by the free application of disinfectants to throat and nose and to the fomites, but with no appreciable measure of success.

Brief Review of Previous Work.

The first suggestion towards a rational approach to the subject came from the laboratory work of Anderson and Goldberger.[4] In their attempts to transmit measles to monkeys they found that once a monkey was successfully infected by inoculation it could not be reinfected, presumably on account of the production of antibodies in the blood. This led Nicolle and Conseil (1918)[5] to try the effect of the serum of children convalescent from measles in preventing the disease in exposed susceptibles; they found that complete protection was almost invariably conferred, subject to certain provisions as to age of patient, dosage, and period of incubation. Since that date numerous observers in America and on the continent have recorded their experiences with the method; different workers have obtained widely varying results, but of a total of 3500 published cases over 97 per cent. were successfully protected. The immunity is merely temporary and is said to last from one to three months. Probably it does not last so long, for towards the end of an epidemic, when injected cases should have already lost their immunity, the virus of measles may perhaps diminish in infectivity and be unable to attack even moderately susceptible subjects.

In this country in the last few years several workers have successfully immunised susceptible contacts, but the literature on the subject is very meagre. Copeman,[6] working in Paris, indicated in 1925 the possibilities of the method and laid down certain rules for time of administration and dosage. Miller and Smith [7] in 1927 gave a brief account of ten cases so treated; five of the ten failed to develop the disease, while in the remaining five the course was distinctly modified. Kingsbury [8] (1927) described the prophylactic measures adopted among natives on Malayan rubber estates and found that 7 per cent. subsequently developed the disease, but in a greatly modified form. More recently McClean,[9] in a note on three cases, was dissatisfied with his results; his failures were probably due to the fact that the batches of serum used were not pooled.

Valuable as the method is, there must necessarily be great limitations to its widespread employment, chiefly on account of the difficulty of procuring an adequate supply of serum. For this reason the attention of numerous workers all over the world has been focused upon the task of isolating the causal agent, especially with a view to preparing an effective immune serum on a large scale. In the course of a comprehensive review of the recent work McCartney [10] endeavoured to assess the merits of the various claims put forward by workers in America and on the continent. He examined these claims chiefly from the viewpoint of the laboratory worker, and concluded that Ferry and Fisher, Tunnicliff, and Caronia fail to bring forward sufficient evidence that the organisms they describe have any specific rôle in the ætiology of measles. He was equally sceptical of the value of Degkwitz's sheep serum either as a prophylactic or a therapeutic measure.

In the present investigation clinical trial has been made of four well-known immune measles sera. To fulfil the claims of the respective sponsors these sera should give protection from measles if injected in adequate doses within four or five days of exposure to infection, or, if given later in the incubation period, should at least produce some attenuation of the disease. The sera tested were: (1) Tunnicliff's "measles antitoxin" (horse serum); (2) Ferry and Fisher's "measles antitoxin" (horse serum); (3) Degkwitz's "immune measles serum" (sheep serum); (4) convalescent measles serum (human serum).

Concentrated Measles Antitoxin (Tunnicliff).

Dr. R. A. O'Brien kindly supplied samples of serum prepared by the Wellcome Physiological Research Laboratories. This serum was obtained from a horse inoculated for several months with increasing doses of the culture filtrate of Tunnicliff's green-producing diplococcus, and was concentrated and refined according to the methods employed in preparing scarlet fever antitoxin. Dr. O'Brien could give no definite information whether or not the serum contained any antibody, and pointed out that such information must depend entirely upon the results of carefully controlled clinical tests. The American literature on the results of the prophylactic use of serum prepared from Tunnicliff's coccus is already extensive, but can hardly be called convincing. The latest contribution is from Halpern [11] (April, 1928), who claims to have successfully protected 63 per cent. of susceptible contacts by the injection of Tunnicliff's immune goat serum. Moreover, the majority of those who received the serum and developed the disease appeared to have had it in an attenuated form without complications. In this country the only record of the employment of the serum comes from McClean, quoted above. He injected nine susceptible children on the fourth day after exposure to measles and three subsequently contracted the disease, apparently in an unmodified form.

Brief details are here given of the sequence of events in three wards where this serum was employed in the prophylaxis of measles.

Q. Ward (Diphtheria).—Eight children (ages varying from 6 months to 4½ years) who gave no previous history of measles had been exposed to infection for 12 hours. On the third day after exposure they were injected with 5 c.cm. of Tunnicliff serum (Wellcome). As a control serum was withheld from one child, aged 5½ years, who likewise gave no previous history of the disease. As it happened this was the only patient who contracted the disease. While this experience could not be held to prove anything, it encouraged a further trial of the serum. It would have been preferable to have had an equal number of exposed susceptibles as controls, but as protection was anticipated, in view of American reports of the efficacy of the serum, it was considered unjustifiable to withhold it from children under 5 years of age.

G.1 Ward (Scarlet Fever).—Seven children (aged from 2 to 8 years), giving a negative measles history, were injected on the second day after exposure to the disease. The dosage adopted was 5 c.cm. of the serum to children under 5 years of age and 10 c.cm. to those over 5; all injections were given intramuscularly into the outer side of the leg. In three patients so injected measles of moderate severity followed on the tenth to the fourteenth day after exposure to infection; in two more cases the disease appeared on the twenty-first and thirty-second day respectively. It is possible that in those two instances the incubation period was prolonged by the action of the serum but, inasmuch as those patients were subsequently re-exposed to infection on the tenth and the twentieth day after the injection and the disease did not appear to be appreciably modified, it seems probable that the serum had no effect whatever. It was ascertained later that one injected patient had had measles previously, leaving only one injected susceptible who did not develop the disease. The course of events in another exposed ward, in which the average age was about the same and where no sero-prophylactic measures were adopted, may be quoted as a control. Of a total of ten susceptibles in this ward eight subsequently contracted the disease, one developing broncho-pneumonia.

P. Ward (Diphtheria).—Seven patients (aged 1½ to 3 years), all with a negative history, received 5 c.cm. of Tunnicliff serum on the fourth day after exposure to measles. One child aged 6, who likewise gave a no-measles history, did not receive serum. All eight patients contracted the disease at periods ranging from the seventh to the nineteenth day after the injection; in every case the attack was mild, the only complication being otitis media in a child of 1½ years. In addition one child of 4 years who gave a definite previous history of measles and did not receive serum, contracted the disease in a typical form.

The results of the use of Tunnicliff serum in 21 patients are given in Table I.

Among the 13 patients composing the control group 11, or 84·6 per cent., contracted the disease,

against 57·1 per cent. in the injected group. The difference—i.e., 27·5 per cent.—represents the actual proportion that were apparently protected. The writer had an impression, which is difficult to express by statistics, of mildness of attack in the injected group, but which suggested the use of larger doses in future.

TABLE I.

Day of exposure.	Susceptibles injected.	Number and percentage developing measles.	Percentage apparently protected.	Number and percentage developing serum reaction.
2	6	5 (83·3)	16·7	1 (16·6)
3	8	0	100	0
4	7	7 (100)	0	2 (28·6)
Total ..	21	12 (57·1)	42·9	3 (14·28)

Serum Reactions.—Although 17 of the 22 patients had had horse serum before there were no serious serum reactions. In nearly all an immediate or accelerated rash appeared at the site of injection, but in most cases it remained localised and caused no constitutional symptoms. In three patients reactions were fairly pronounced; pyrexia, malaise, arthritis, and rashes of urticarial and morbilliform type were present, but no untoward effects ensued.

Conclusion.—While all the injected cases who developed measles exhibited the disease in a fairly mild form, with few complications and no deaths, there is no certain evidence to show that the type or course of the disease was modified in any given case by the use of Tunnicliff serum.

Concentrated Measles Antitoxin (Ferry and Fisher).

Measles antitoxin prepared by Drs. Ferry and Fisher[12] of Detroit was supplied by Dr. J. Stanley White, of Messrs. Parke, Davis and Co. This serum was prepared from horses immunised by increasing doses of the culture filtrate of Ferry and Fisher's organism (the so-called "*Streptococcus morbilli*") and was concentrated by accepted methods. The serum was issued for experimental purposes only, as its antitoxic potency had not yet been determined.

R.1 Ward (Diphtheria).—Twelve presumably susceptible children (ages ranging from 8 months to 3½ years) had been exposed to measles for 18 hours. On the fourth day after exposure they were each injected intramuscularly with 5 c.cm. of measles antitoxin (Ferry and Fisher). One infant aged 3 months and four children who gave a previous history of measles were not inoculated. All 12 injected cases developed measles of moderate to marked severity on the eleventh to the fourteenth day after exposure to infection; two cases developed purulent otitis media, but serious pulmonary complications were absent. One patient who gave a previous history of measles had an attack of similar severity to that of the injected group on the twelfth day after exposure.

The findings are given in Table II.

TABLE II.

Day of exposure.	Susceptibles injected.	Number and percentage developing measles.	Percentage apparently protected.	Number and percentage developing serum reaction.
4	12	12 (100)	0	4 (33·3)

Serum Reactions.—In four patients serum reactions of moderate to marked severity were observed, characterised by pyrexia (102°–103° F.), malaise, adenitis, and arthritis, with various types of rashes, but no ill-effects followed.

Conclusion.—Ferry and Fisher's anti-measles serum gave no indication of power to confer immunity from the disease or to modify its course in any way. One-third of the patients showed marked serum reactions, which inconvenienced them considerably but did not appear to have any untoward effect on the course of the disease.

Degkwitz's Immune Sheep Serum.

This serum was made available for clinical t through the kindness of Dr. Charles Todd, who recei supplies from Dr. R. Degkwitz, of Munich. Ex details of its manufacture are not given, but appears that sheep are repeatedly inoculated w filtrates of nasopharyngeal secretions from meas patients and with tissue cultures inoculated w measles virus" (McCartney[10]). Widely varyi reports, on the whole disappointing, of the value the serum in measles prophylaxis have already be published on the continent, but it does not appear have been used on any scale in this country.

Ten susceptible children who had been exposed measles were injected intramuscularly with 5 c.c of Degkwitz's serum; all were under 5 years of a Of these six were patients at the North-Easte Hospital under the care of Dr. J. C. Blake, to whc I am indebted for the clinical details, while the remai ing four were injected at the Park Hospital. All I Blake's cases were injected on the fifth day aft exposure, which is the optimum time given Degkwitz for serum treatment. The intervals betwe exposure and time of injection, with the results of t administration of the serum, are briefly given Table III.

TABLE III.

Day of exposure.	Susceptibles injected.	Number and percentage developing measles.	Percentage apparently protected.	Number and percentage developing serum reactio
2	4	1 (25)	75	1 (25)
5	6	5 (83·3)	26·7	1
Total ..	10	6 (60)	40	1 (10)

The patients who developed measles exhibited th disease in a typical form, apparently without attenua tion. A serum reaction was noted in one patien only—slight pyrexia with transient generalise urticaria. In certain patients in whom measles super vened at the time when serum disease usuall develops it was difficult to exclude the possibl concurrence of the two diseases.

Conclusion.—Degkwitz's serum does not appear t contain any antibody; if any is present it is insufficien to prevent the onset of measles.

Convalescent Measles Serum.

In a large city like London, where opportunities fo infection during childhood are so frequent, it i comparatively rare to see an adult suffering from measles; consequently it is somewhat difficult t obtain adequate and regular supplies of convalescent measles serum. The average age of measles patients admitted to one of the Metropolitan Asylums Boards' institutions during the recent epidemic was two and three-quarter years, while admissions over the age of 7 years numbered less than 2 per cent. Even when a suitable adult convalescent is available it is not always possible to obtain the necessary consent to procure blood except to protect members of his own family.

Technique.—In the present series 21 donors were used; all were under the age of 10 years and the majority were under 6. Amounts of blood varying from 20 to 60 c.cm. were withdrawn from each convalescent donor from one of the ante-cubital veins, at an interval of 10–14 days after defervescence. All the cases selected were of moderate severity and ran an uncomplicated course. Care was taken that the subjects were vigorous, free from tuberculous or syphilitic taint, and not incubating, as far as was known, any infectious disease. The blood was drawn into agar-lined test-tubes of 50 c.cm. capacity and placed in the incubator for one hour, when the supernatant serum was pipetted off. The remainder was centrifuged for 20 minutes and added to the rest; in most cases the blood yielded one half or more of its volume of serum. The Wassermann reaction was performed on each batch, tests for sterility were carried out, and three or more samples were pooled and put up in sealed glass ampoules, each containing 3 c.cm., 4 c.cm., and 5 c.cm. of serum respectively. No disinfectant or preservative was

added to the serum. The finished product was stored in the cold room at 4° C. until required. Of the 21 samples one gave a positive Wassermann reaction and was discarded. The donor in question showed no clinical evidence of syphilitic infection and appeared healthy in every way.

In every instance the serum was employed with the express purpose of affording protection, in order to control outbreaks of measles and avoid putting the cross-infected wards in quarantine. The dosage adopted was: 3 c.cm. for children under 1 year, 4 c.cm. for those between 1 and 5 years, and 5 c.cm. for those over that age if injected on or before the sixth day after exposure, but relatively larger doses were given if the injection was made after the sixth day. All the injections were given intramuscularly.

The serum was employed in five wards in which outbreaks of measles had occurred.

D.1 Ward (Scarlet Fever).—Twelve patients in a ward of 22 gave a negative history of measles; the ages ranged between 1½ and 6½ years. Convalescent measles serum was not immediately available, but on the sixth day after exposure five susceptibles were injected with 4 c.cm. of pooled serum. None of the five developed the disease. The remaining seven patients were injected on the eighth day after exposure, each receiving 5 c.cm. of serum. One of these, aged 5½ years, had slight fever and mild catarrhal symptoms on the fourteenth day after exposure; next day Koplik's spots were observed and were visible for the three following days. On the fifth day after the onset a faint rash appeared behind the ears, while on the sixth traces of rash were seen on the trunk for a few hours. The temperature never rose above 100° F. and the constitutional disturbance was trivial. Another of the seven, aged 4 years, showed mild fever and Koplik's spots for three days, when a similar limited and transient rash appeared, leaving no staining. Two patients, aged 3½ and 5 years respectively, who gave a history of previous measles and were consequently not injected, contracted the disease in a typical form on the twelfth day after exposure, one of them developing pneumonia.

All fresh scarlatinal patients admitted to the ward who gave a negative history of measles were immediately given an injection of serum according to the scale mentioned previously; as a result the ward was free from measles for 22 days. On the twenty-third day, however, a child, aged 4½ years, who had received 4 c.cm. of serum on admission, showed a rubella-like rash which lasted only for 24 hours; pyrexia, malaise, catarrhal symptoms, and Koplik's spots were all absent. Next day a patient aged 5 years, who was similarly injected, showed a condition practically identical in rash distribution without the characteristic features of measles. The diagnosis rested between abortive measles and rubella, with the probability in favour of the former. This was confirmed 12 days later when a patient, aged 4 years, with a history of previous measles developed the disease in a typical form, having been infected presumably by either of these two abortive cases. After this experience it was decided to inject all fresh arrivals under 5 years of age, irrespective of their history. No further cases of measles appeared in this ward. No information was available from these cases on the duration of the protection. One patient, to whom the disease would probably have proved fatal at the time, was reinjected six weeks after the first injection as a precaution against possible loss of immunity.

D. Ward (Scarlet Fever).—Twelve patients who gave no previous history of measles, and four under 5 years of age who gave a positive history, were injected two days after exposure to the disease. Despite the outbreak fresh patients were admitted to the ward, even although they had no previous history of measles. No secondary case of the disease occurred, so further injections were unnecessary.

O. Ward (Diphtheria).—No convalescent measles serum was available when an outbreak occurred in this ward, and as a result seven out of ten susceptibles contracted the disease. When a supply of serum was forthcoming fresh cases were admitted, each receiving the appropriate dose for the age. Four patients were injected; one of these, aged 3½ years, developed a discrete macular rash on the fifteenth day after exposure to measles; pyrexia, malaise, and catarrh were absent, but doubtful Koplik's spots were noted for a few hours. The case was regarded as a modified or abortive form of measles. The serum used for these four injections was monovalent, so lack of antibody production in the donor may have been responsible for its failure. It is interesting to note that the donor had received a "prophylactic" dose of Tunnicliff's serum four weeks previously, but had contracted the disease in due course without apparent modification.

P.1 Ward (Diphtheria.)—Six susceptible children were injected, according to the dosage detailed above, on the second day after exposure; no further cases of measles occurred.

H.1 Ward (Scarlet Fever).—Nine children giving a negative measles history, and two under 5 years of age who gave a positive history, were inoculated on the third day after exposure to measles; none of the injected group contracted the disease, but one control patient developed it on the eleventh day after exposure.

Serum Reactions.—No serum reaction, local or general, followed the administration of the human serum.

The results of 74 injections of convalescent measles serum are presented in Table IV.

TABLE IV.

Day of exposure.	Number of susceptibles injected.	Number and percentage developing measles.	Percentage apparently protected.
1	35	3 (8·57)	91·43
2	18	0	100
3	9	0	100
6	7	0	100
8	5	2 (40)	60
Totals ..	74	5 (6·75)	93·25

Conclusion.—Convalescent measles serum is a safe and reliable agent both in the prevention and the attenuation of measles. The results of the first day injections would appear to be less satisfactory than those of the second to sixth days after exposure to the disease. The three cases of measles occurring after administration of serum on the first day were so mild that there was considerable difficulty in deciding the diagnosis; none of the typical features of the disease was present, and the only manifestation was a rash which resembled rubella rather than roseola. One of the failures may reasonably be ascribed to the fact that the serum employed was obtained from one donor; the other two may possibly have been due to subprotective dosage (4 c.cm. for children of 4½ and 5 years of age respectively). The two patients who contracted the disease after injection on the eighth day after exposure presented all the usual features of the disease but in a mild form, and suggested the possible therapeutic value of the serum.

The results of the prophylactic administration of the four sera are briefly summarised in Table V. For purposes of strict comparison only injections given before or on the sixth day after exposure are included; the five injections of convalescent serum given on the eighth day are therefore omitted.

TABLE V.

Serum injected.	No. of susceptibles injected.	Percentage.		
		Developing measles.	Apparently protected.	Serum reactions.
Tunnicliff ..	21	57·1	42·9	14·28
Ferry and Fisher's	12	100	0	33·3
Degkwitz's ..	10	60	40	10
Convalescent serum	69	4·3	95·7	0

The entire control group consisted of 23 patients who gave a negative history of measles; of these 18, or 78·3 per cent., subsequently developed the disease. In other words, in 21·7 per cent. of the control cases the negative history was inaccurate, the patients were naturally immune, or they were fortunate enough to escape infection from the primary cases. Due allowance for this proportion must be made when examining a series of "protected" cases after the administration of any prophylactic serum, animal or convalescent.

A review of the foregoing tables clearly shows that, until we have an animal serum more efficient than those used in the present investigation, convalescent serum must remain the only certain method of controlling

the disease. The results of its employment justify a wider recognition of its value, and its application in public health administration generally.

I wish to acknowledge my gratitude to Dr. J. E. McCartney, director of Research and Pathological Services, Metropolitan Asylums Board, through whom the animal sera were obtained, and under whose direction the convalescent measles serum was prepared at the Southern Group Laboratory; and to Dr. T. H. Woodfield, medical superintendent of the Park Hospital, by whose courtesy and kindness this work was carried out.

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THE ACTION OF OXYTOCIN AND VASOPRESSIN ON THE UTERUS IN LABOUR.

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RECENTLY Kamm, Aldrich, Grote, Rowe, and Bugbee[1] have described the separation of two extracts of the posterior lobe of the pituitary body, the one having the oxytocic property (the power to stimulate the musculature of the uterus) and the other having the pressor property. The first has been prepared by Parke, Davis and Co., under the name of oxytocin, and the second under the name of vasopressin. In this country, Gaddum[2] has confirmed the claim that oxytocin has only a trace of pressor activity, and that vasopressin has only a trace of oxytocic activity. Through the kindness of Messrs. Parke, Davis and Co., samples of these two extracts have been placed at our disposal for the determination of their action on the human uterus in labour.

Method.

Our method has been the one which we have already described,[3] in which a small rubber bag, shaped like a disc and attached to the end of a gum elastic catheter, has been inserted in the uterus in order to record the changes of intra-uterine pressure. The end of the catheter outside the vagina is attached by way of a thick rubber tube to a mercury manometer, so that changes of pressure on the bag in the uterus are transmitted along the fluid, with which the bag and tube are filled, to the manometer, and a record of the changes is obtained on a slowly moving drum. The bag is inserted into the uterus as a sterile object with full aseptic precautions when the patient is anæsthetised. A time is chosen when the os is sufficiently dilated (admits two fingers) to make the insertion a simple matter, and the bag is pushed up into the uterus outside the membranes until it is past the fœtal head. As we have explained, this procedure involves the application of no force and does not interfere with the normal course of labour.

Action of Oxytocin.

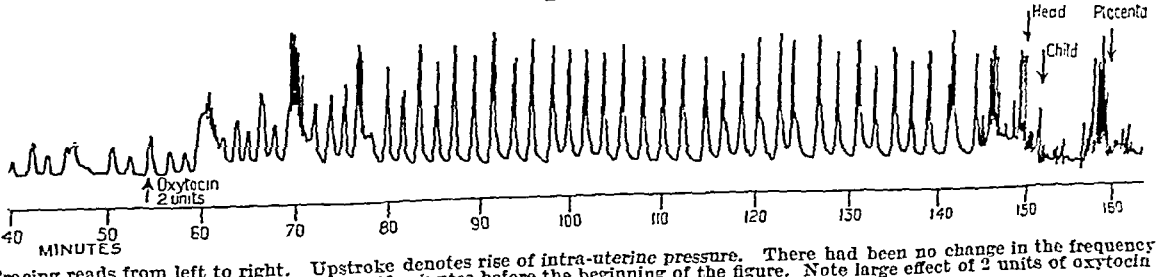
It is to be remembered that, in separating oxytocin and vasopressin, Kamm and Aldrich and their co-workers were using as a guide to the oxytocic principle the action on the isolated uterus of the guinea-pig. It has always been possible that pituitary principle which stimulated the parturient human uterus was not the one which stimulates the non-pregnant guinea-pig uterus; at one stage, indeed, of our previous work[3] the evidence seemed to favour this view. However, the direct test of oxytocin on the human uterus at once dispelled all doubt. Whereas oxytocin has a powerful stimulant action, vasopressin, even in large dose, has little effect of any kind on the uterus in labour.

Fig. 1 shows the striking increase of uterine activity following the injection of 2 units of oxytocin. The patient was a primipara who had been in labour for 16 hours when the bag was introduced into the uterus. The os was dilated to a diameter of 2 in. The uterine contractions were recorded for 55 minutes before any injection was made, and during this time there was no obvious change in their frequency or force. The last 25 minutes of this period is shown on the left-hand side of Fig. 1. Two units of oxytocin were then injected into the buttock. A striking augmentation of the pains occurred in 5 minutes, and in 25 minutes the pains assumed the character which we have learnt to associate with the second stage. As the record shows, the child was born 95 minutes after the injection and the placenta 10 minutes later.

Action of Vasopressin.

Fig. 2 A shows that vasopressin, even in large dose, has no stimulant effect. The patient was again a primipara who had been in labour 15 hours when the bag was introduced; at this time the os was dilated to a diameter of 1 in. After 40 minutes, in which a record was obtained, 12·5 units of vasopressin, a relatively large dose, were injected into the buttock. The tracing shows (Fig. 2 B) that there was no augmentation in the force or frequency of the contractions, but from 15 to 25 minutes afterwards the relaxation following the contractions was very slow. It was conceivable that the vasopressin had produced a spasm of the vessels leading to the uterus, so that the return of blood to the relaxing uterus was

FIG. 1.



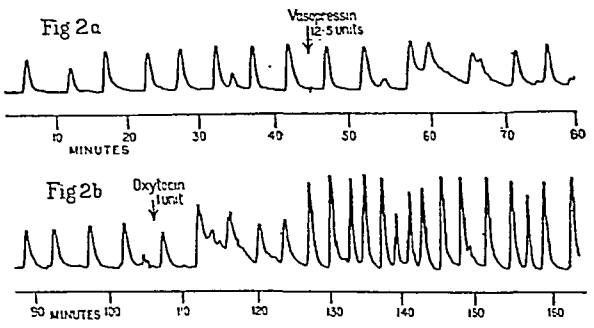
Tracing reads from left to right. Upstroke denotes rise of intra-uterine pressure. There had been no change in the frequency and force of contractions during the 40 minutes before the beginning of the figure. Note large effect of 2 units of oxytocin persisting to delivery. The tracing before the injection represents typical primary inertia.

delayed, and consequently the relaxation itself was delayed. The second portion of the tracing (Fig. 2 B) shows that this injection of a large dose of vasopressin did not interfere with the action of 1 unit of oxytocin injected one hour later. The response to the oxytocin followed at the usual interval and was great enough to carry the dilatation of the os from the half-dilated condition which was observed just before the injection, to full dilatation in about 20 minutes, when second-stage pains were recorded. The observation that the effect of oxytocin is not diminished by the previous injection of a large dose of vasopressin is of interest in relation to the common experience that a second dose of pituitary extract is relatively ineffective. Evidently one injection of oxytocin must render the uterus less susceptible to a second, and the vasopressin element in pituitary extract plays no part in this loss of susceptibility.

Oxytocin Compared with Pituitary Extract.

In our previous work [3] we showed that the response of different patients to the same dose of pituitary extract—namely, 2 units—varied considerably; in some cases the increased activity of the uterus was

FIG. 2.



(*a*) Note absence of stimulating effect on uterus from large dose of vasopressin; (*b*) a good stimulant action from 1 unit of oxytocin in spite of previous injection of vasopressin.

maintained until the birth of the child, so that the injection resulted in a material shortening of labour, whereas in others the effect abated in about one hour. In general, we found that the effect was small and transient if the injection was made too early in labour, but that it was useful and prolonged when given after the os was half dilated. With oxytocin we have found a similar difference in the response in different patients. Fig. 1 is, of course, an example of a big effect, while Fig. 3 is an example of a small one. In this patient the augmentation produced by the injection subsided in 50 minutes.

The Usefulness of Oxytocin.

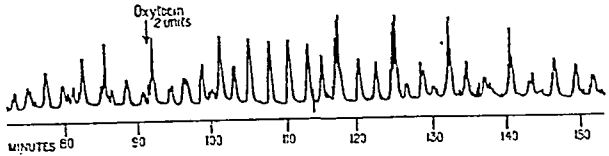
In spite of the fact that we have found no difference in the action of oxytocin on the uterus from that of pituitary extract, the use of oxytocin has the advantage of precluding the possibility of pituitary shock. Little attention has hitherto been paid to this phenomenon, but it has been recognised for some time among obstetricians, and a striking example was recently described by Lawrence and Shackle.[4] In this instance a dose of 10 units of pituitary extract had been injected into a patient four days after delivery to assist in retraction of a lax uterus. After 10 minutes the patient felt faint, and in 20 minutes she became unconscious and rigid; her breathing became heavy and her colour changed from white to blue. After 30 minutes her systolic blood pressure was found as low as 70 mm. She then recovered.

Although the cases recorded are very few, the occurrence of symptoms resembling these is sufficiently common to have led to a refusal on the part of some obstetricians to use pituitary extract even after delivery of the placenta. To these the use of oxytocin in place of pituitary extract can confidently be recommended, for it is without any of the vasomotor effects which are responsible for the collapse.

Summary.

1. The action of oxytocin and vasopressin, the separated constituents of pituitary extract, has been examined on the human uterus in labour by a method

FIG. 3.



A small effect produced by 2 units of oxytocin. The effect had completely passed off in 50 minutes.

which enables a graphic record of intra-uterine pressure to be taken.

2. Oxytocin possesses the typical stimulant action, whereas vasopressin has no effect, even in large dose.

3. A given dose of oxytocin (2 units) produces a large response in one patient, a small one in another. Our experience with it confirms our previous conclusion about pituitary extract, that a dose of 2 units will, as a rule, produce a useful effect if administered when the os is at least half dilated.

4. Oxytocin may safely be used by those who have refrained from using pituitary extract because of the danger of shock.

We should like to express our indebtedness to the matron and sisters of Queen Charlotte's Hospital, from whom we have received valuable coöperation.

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THE ACTION OF THE POST-PITUITARY PRINCIPLES ON THE BLOOD.

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SEVERAL investigations have been made into the action on the blood of extracts of the posterior lobe of the pituitary body. Hypercoagulability was demonstrated by Weil and Boyé,[1] and by La Barre,[2] who found that the substances present in the extract are incapable of provoking blood clotting but accelerate the formation of thrombin and also increase the action of thrombin on fibrinogen. From clinical observations it has been suggested that the leucopenia and blood pressure changes are correlated with the production of hypercoagulability, and are due to direct action on plasma complexes.

The existence of more than one active principle in post-pituitary extracts has been denied by Abel,[3] Geiling,[4] and others, but Dale and Dudley [5] and others maintain that at least three principles, with differing activities, can be separated from the extract. More recently, Messrs. Parke, Davis and Co. have obtained in their laboratories, in a state of comparative purity, two fractions, which they have named respectively vasopressin and oxytocin. The former raises the blood pressure and has little action on the uterus, and the latter has a marked stimulating effect on the uterus with little or no effect on the blood pressure. The object of this paper is to describe the actions of these fractions on the blood as indicated by alterations in its coagulability and the rapidity of sedimentation of blood corpuscles.

Methods.

In this series of experiments cats were employed. The animals were anæsthetised throughout with chloroform, which has very little effect on the coagulation of blood shed at a temperature of 18°–20° C. Blood samples were obtained by means of cannulæ in the femoral arteries. After each withdrawal of blood the cannulæ were thoroughly washed and re-inserted higher up the artery. This prevents contamination of the blood with tissue juices. In some cases, also, samples of blood were obtained by puncture of the heart, but these cannot be regarded as free from tissue juices. The blood was shed into chemically clean glass vessels which were kept at constant temperature throughout the experiment, and were covered with moistened filter papers to prevent evaporation. The first departure from fluidity observable with the naked eye was taken as the beginning of clotting, and clotting was said to be complete when the vessel could be inverted without spilling. For estimating the speed of sedimentation citrated blood was employed.

Individual variations of coagulation times of the blood in animals of the same species are well known. For this reason control experiments were made before every injection was given and the effects produced are expressed as differences of coagulation times before and after the injections.

Abridged Results.

Vasopressin increases the coagulability of the blood both in fasting animals and in those at the height of digestion. This is important, as recent work indicates that there are differences in the condition of the blood according to whether the animal is fasting or digesting a full meal (Czubalski [6]), and this may be manifested in man when transfusion of blood is practised (Brem and collaborators,[7] and Pickering [8]).

Thus, in a fasting cat weighing 2·2 kilos, 0·5 c.cm. of vasopressin injected into a brachial vein decreased the clotting time at 19° C. from 5 mins. to 3 mins., the hypercoagulability lasting to a lesser degree for 25 mins. Subsequent doses decreased the clotting time from 6 mins. to 5 mins.

The effect on an animal during the height of digestion may be illustrated as follows: In a cat weighing 3·2 kilos the intravenous injection of 0·6 c.cm. of vasopressin two or three hours after a full meal decreased the clotting time of the blood at 16·5° C. from 5 mins. to 3 mins. 30 secs.

The action of vasopressin on the coagulation of the blood is due to increased speed in the initial changes of blood clotting, the speed of the later phases not being appreciably affected. The effect is not masked by the presence of serum artificially introduced into the circulation.

In only one experiment was an anomalous result produced. Blood shed from a femoral artery after the injection of 0·6 c.cm. of vasopressin remained fluid at 16·2° C. for 36 mins., the clotting time being increased by 23 mins. This result appears comparable to an anaphylactoid reaction.

The previous intravascular injection of sufficient heparin to inhibit blood coagulation prevents the hypercoagulability produced by vasopressin.

The tendency to thrombosis in a vein isolated between two ligatures after injecting the vasopressin is not increased, and the speed of sedimentation of blood corpuscles is not altered.

After severe hæmorrhage, vasopressin either has no augmenting effect or delays the coagulation of the blood.

In a cat weighing 2·9 kilos subjected to a hæmorrhage of 30–35 c.cm., which reduced the clotting time from 7 mins. to 4 mins., the administration of 0·6 c.cm. of vasopressin increased the clotting time from 4 to 9·5 mins.

Oxytocin, when intravenously injected, increased the clotting time of the blood.

In a cat weighing 2·9 kilos the injection of 0·5 c.cm. increased the clotting time from 4 mins. 20 secs. to 50 mins. The clotting times of blood shed later were increased by 2 min., and still later by 5 mins., the effect persisting for half an hour after the injection. Subsequent doses only slightly altered the coagulability.

The anticoagulant action may be attributed to the suppression of changes in the blood which lead to the inception of clotting, as the later phases of coagulation proceed with normal rapidity.

The injection of oxytocin after hæmorrhage produces increased coagulability.

For example, after a hæmorrhage of 30 c.cm. in a cat weighing 3 kilos, the injection of 0·6 c.cm. of oxytocin decreased the clotting time from 8 mins. to 3·5 mins. and then to 2 mins. 20 secs., the effect being produced in 10 mins. The rapidity of the sedimentation of blood corpuscles was unaffected during the last-mentioned experiment, but is increased when the clotting time is increased.

Oxytocin after hæmorrhage does not show any tendency to produce thrombosis in a vein isolated between two ligatures a minute or two after the injection.

Discussion.

It seems clear that the two fractions of the posterior lobe of the pituitary body act differently on blood plasma—vasopressin augmenting and oxytocin inhibiting coagulation. The conclusion of Dale and others that more than one active principle is obtainable from the posterior lobe is thus supported. It should be noted that the general reaction with vasopressin is identical with that obtained with the ordinary post-pituitary extract (La Barre [2]). It is not, however, suggested that the two fractions normally exist free. In view of our findings it seems probable that they are combined in such a way that either the effect of oxytocin on the blood is inhibited, or vasopressin for some reason neutralises the effect of oxytocin and is enabled to bring about the hypercoagulability which is found when whole posterior lobe extract is used. There is, of course, the possibility that the pressor principle is much more abundant than the oxytocic principle, though the two principles maintain a constant ratio, as it is well known that the posterior pituitary extract may be standardised both on the blood pressure and the uterus. Variations have, however, been found and, in the light of Dixon and Marshall's [9] investigations on pituitary secretion and pregnancy, it would be interesting to determine the effect on blood coagulation of extracts of pituitary bodies obtained from animals in the last stages of pregnancy when, according to Dixon and Marshall, the oxytocic activity of the pituitary body is at its greatest. Significant in this connexion is the observation of Manuel and Moreira [10] that the blood of pregnant women may become hypocoagulable as pregnancy proceeds. As, however, their technique is open to criticism (Pickering [8]), their experiments should be repeated.

The differences of the reactions on blood plasma produced after hæmorrhage appear to be of practical importance. The failure of vasopressin to increase coagulation of the blood after hæmorrhage detracts from its value as a hæmostatic. The ability of oxytocin to convert hypocoagulability into hypercoagulability after hæmorrhage should be of considerable advantage during and after labour, when the contractile action of oxytocin on the uterus is supplemented by more rapid clotting of the blood with hardly any increase of blood pressure.

The conditions that favour thrombosis, particularly the formation of white thrombi, have recently been summarised by one of us (Pickering [8]). In normal subjects the principal factors are (1) venous stasis, (2) increased rate of sedimentation of blood corpuscles, (3) ingress of tissue juices into the blood stream, and probably alterations in the agglutinability of blood platelets, arising from changes in the condition of the blood plasma. It should be noted that neither of the preparations examined produced thrombi when blood was confined in a vein by ligature, and that the rate of sedimentation of corpuscles was not increased; nor was there any evidence of abnormal platelet agglutination.

If the results in man correspond with those in the cat it would seem that these fractions do not predispose to thrombosis.

We are indebted to Messrs. Parke, Davis and Co. for their courtesy in supplying the pituitary fractions used in these experiments.

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A CASE OF INFECTIVE ENDOCARDITIS DUE TO *STREPTOCOCCUS MUTANS*.

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AND
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THE condition to be described is one of congenital subpulmonary stenosis, with interventricular septal defect and patent ductus arteriosus, complicated by infection with *Streptococcus mutans* (Clarke). As so often happens, the site of the developmental error proved a point of lowered resistance to infection, the source of which was most probably dental sepsis.

The patient was the child of a first pregnancy; he presented no developmental anomalies other than those in the heart, and the family history is exceptionally clear. We are indebted to Dr. H. Morley Fletcher for the following note: "I saw this patient for the first time when he was 6½ years old. He was well-grown, rather highly coloured but not cyanosed, and there was no clubbing of the fingers. His general condition was very good, and he was able to play like other boys without becoming dyspnœic. There was a systolic thrill and a very loud rough systolic murmur over the pulmonary area. The murmur was not conducted into the carotids, nor was it heard posteriorly over the course of the aorta. The cardiac dullness was increased to the right of the sternum. The case was regarded as probably an unusual form of that variety of congenital pulmonary stenosis in which the pulmonary conus is narrowed as is the conus arteriosus in what is known as subaortic stenosis. Compensation was almost perfect, and I thought the prognosis good. He grew up to be a finely built young man—a great contrast to those poorly developed sufferers whose pulmonary stenosis is accompanied by cyanosis."

Following Dr. Morley Fletcher's advice, the boy's activities were restrained as little as possible; he passed through preparatory and public schools successfully, and though not allowed to run in races or to play Rugby football, he thoroughly enjoyed what was practically a normal life, being a good swimmer and playing cricket, tennis, and fives. In 1924, after two attacks of tonsillitis, his tonsils and adenoids were removed by Mr. F. J. Cleminson. In 1926 he had two attacks of cardiac pain with rapid pulse and laboured breathing, apparently due to taking indigestible food. Otherwise he had only the usual amount of illness, and in spite of his loud murmur he slept soundly. In 1927, at the age of 18, he was 6 ft. 2 in. in height, weighed 11 st. 8 lb., and his pulse-rate ranged from 52 to 60. His colour was high, and he was slightly blue in very cold weather. There was no bulging or pulsation over the præcordial area or in the scrobiculus. The very loud systolic murmur was best heard at the base, the vigorous thrill best felt at the apex. He had no abnormal dyspnœa even on exertion.

Onset of Disease.—On July 15th, 1927, while taking the examination for the Higher Certificate, he felt unwell and was found to have a temperature of 100° F. The temperature became normal after 48 hours and he was allowed up, but two days later there was again slight fever, which persisted. The Widal reaction was twice negative and there was no evidence of pulmonary tuberculosis. In the first week in August the evening temperature was just over 101° F., pulse-rate 70 to 82, and leucocyte count 11,900, the differential count being without significance. On August 2nd a small streptococcus was obtained by blood culture: this organism was recovered on every occasion (3) during life, and also post mortem from the heart. There were no rigors at any stage of the disease, and no change in the heart murmur was noted.

Possible Source of Infection.—In the absence of tonsils and adenoids, and the antra and nasal sinuses appearing quite healthy, attention was directed to the teeth. These had always been somewhat soft, but had been regularly examined three times a year. In 1923 the patient had suffered from spongy gums, which had been vigorously treated, and since that time he had always taken unusual care of his teeth and gums. Dental radiography on three occasions during the course of the disease failed to demonstrate any source of infection. There was, however, a heavily-stopped lower molar, dark in colour, with some tartar and gingivitis around its socket. On examination after removal, the pulp cavity showed a heavy mixed infection, and it seems probable that this tooth was the original source of the septicæmia. Its extraction on August 19th produced no improvement in the pyrexia. One other heavily-stopped molar, subsequently removed, was found healthy.

Course of the Disease.—During the next two months no new symptom presented itself. In the middle of September, morning and evening temperatures were on a slightly lower level than formerly, possibly as a result of the injection of small doses of autogenous vaccine. On Oct. 14th the chest was X rayed, the heart shadow appearing nearly normal in size and shape. Ten days later there were signs of renal infarction; the temperature rose to 102° and the pulse-rate to 100; the urine became scanty and blood-stained, the average daily amount being 25 oz., sterile on culture, but containing 8 parts of albumin per 1000. On Oct. 31st vomiting began and there were occasional rises of temperature, but after Nov. 14th the temperature became subnormal and did not rise again. The patient maintained his condition remarkably well, but was weakened by frequent vomiting and by epistaxis. On Nov. 29th signs of ascites were present, and on Dec. 2nd a very severe hæmorrhage took place from the nose, and probably also from the intestine. On Dec. 5th an ascending paralysis was observed, which, beginning in the legs, rapidly extended upwards until the patient could move only the muscles of the neck and face. The mental faculties remained normal. He died on Dec. 9th, nearly five months from the onset of the disease; during this time he had grown 5 in. in height, so as to be 6 ft. 7 in. at the time of his death. There was no terminal cyanosis.

Post-mortem Examination.

At autopsy the peritoneal cavity contained free fluid. Both kidneys were very much enlarged and congested, the spleen and liver being similarly but less affected. The kidneys were sterile, but the streptococcus previously found in the blood was recovered in pure culture from the spleen and from the vegetations on the endocardium. The heart's shape was much more nearly square than usual, being 4½ inches in height and breadth and nearly 3 inches thick. By cutting a small window in the wall of the right ventricle, Sir Arthur Keith demonstrated that the principal malformation was due to the imperfect union of the body with the infundibulum (bulbus cordis) of the right ventricle, and that the specimen was a very unusual one in that this union was nearly complete, only a ring of thickened fibrous endocardium remaining at the site of the junction of the body and infundibulum. The pulmonary valves were quite healthy and there was no narrowing of the pulmonary orifice, but the presence of this ring, the ostium bulbi, ½ inch below, oval in shape, and measuring ½ inch by ¼ inch, had produced an hour-glass constriction in the right ventricle, aptly described as subpulmonary stenosis. "It was on this ring," to quote Sir Arthur Keith, "that the vegetations formed and where the real obstruction and friction occurred. There was, as nearly always in such cases, an interventricular foramen at the base of moderate size (⅝ inch in diameter), and very great dilatation and hypertrophy of both ventricles, both being equally thick (¾ inch). The aortic stem, which rises immediately above the interventricular foramen, is smaller and thinner-walled than is the pulmonary artery; at least two-thirds of the blood, venous and arterial, left the heart by the pulmonary artery, and I suspect there had been a constriction on the aortic arch. There must have been an open ductus arteriosus, but owing to the limited post-mortem examination granted, that and the aorta were cut away. For the same reason it is impossible to say whether the foramen ovale was patent or not. In such hearts with the increase in dilatation and hypertrophy of the left ventricle, the infundibular opening in the right ventricle becomes more and more compressed, and

Drs. Curtis and Pickering: References.

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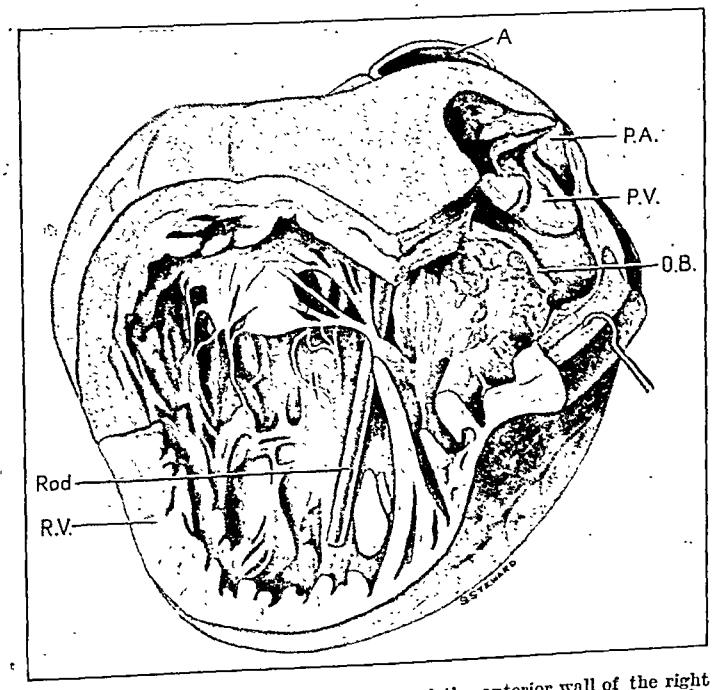
thus the blood as it passes through the obstruction produces friction and a loud systolic substernal bruit, often mistakably assigned to the ductus. Owing to this friction the endocardium becomes frayed and therefore prepared for infection, precisely as in this case, where vegetations had been superimposed upon the fibrous ring. There were none elsewhere."

Bacteriology.

A streptococcus was obtained in pure culture on each of the three occasions on which blood was withdrawn during life and from the endocardial vegetations post mortem. Culture was performed by adding 10 c.cm. of blood (or a fragment of vegetation) to 100 c.cm. of nutrient broth containing 1 per cent. of glucose. The bacterial growth appeared in two to three days in the form of whitish granules on the surface of the sedimented blood; a coarsely granular turbidity in the supernatant broth developed later. Subcultured on glucose agar containing 10 per cent. of horse blood, the growth appeared as minute ivory-like domes of pin-head size in 24 hours, reaching a diameter of 1 mm. in two days when sufficiently spaced. These larger colonies later developed knobs, which gave them a cauliflower appearance, and growth occurred in similar fashion in the depths of the medium, so that when dug out whole, the colonies appeared as firm ivory-coloured, mulberry-surfaced spheres. On media free from glucose, even when containing blood, growth was slight, broth showing only a fine sediment and agar colonies barely visible to the unaided eye. There was no hæmolysis in liquid or solid media, and no evidence of peroxide formation, the blood turning to brown or buff without any green discoloration. Fermentation tests showed that the streptococcus produced acid from glucose, lactose, saccharose, raffinose, mannite, and salicin. Microscopically the coccus appeared in liquid media as a minute round cell of rather under 1 μ in diameter arranged in short chains; in glucose broth (in which a copious flocculent growth occurred) the cocci were in very long chains of round cells which rapidly became Gram-negative as contrasted with the strongly Gram-positive staining of those from other media. On glucose agar the majority of the bacterial elements appeared in rod form, the microscopical picture resembling that of a culture of diphtheroid bacilli. But such cultures reverted immediately in glucose-free media to the original streptococcus form. These properties recalled those described by Clarke [1] for the streptococcus which he isolated from carious teeth and named *Streptococcus mutans*. In fact, when a culture of Clarke's streptococcus was obtained (through the kind offices of Dr. L. Colebrook), it was found to give identical appearances on all media. Moreover, an agglutinating serum (obtained also from Dr. Colebrook) gave typical full-titre agglutination (about 1 in 2000) with the streptococcus under investigation. Completing the identification, a serum prepared with the latter agglutinated Clarke's streptococcus, and was robbed of its agglutinin on saturation with it.

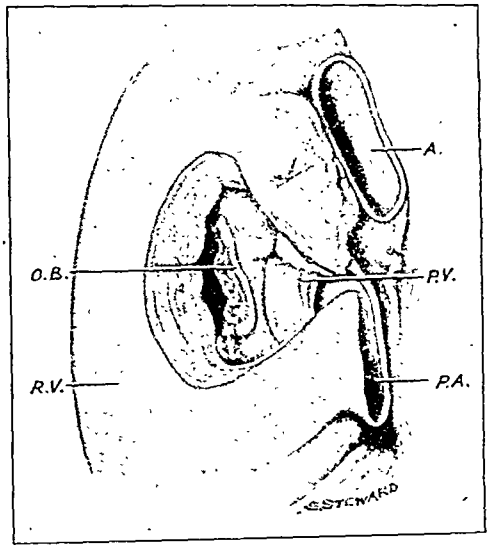
FIG. 1.



Shows the heart with the greater part of the anterior wall of the right ventricle removed, and the cut edge drawn aside to expose the obstruction; the vegetations superimposed upon the fibrous ring are easily seen.

A = Aorta. P.A. = Pulmonary artery. P.V. = Pulmonary valves. O.B. = Ostium bulbi. R.V. = Right ventricle. The rod is passing upwards to enter the interventricular foramen.

FIG. 2.



Shows the condition seen from above, and gives a good idea of the stenosis below the pulmonary valves.

There appears to be no doubt that the fatal infection in the case described was actually one of *S. mutans*.

Dr. Clarke has been good enough to give us details of three other cases of fatal endocarditis in which this streptococcus was the causal agent. Two of these he described in a communication to the Pathological Society of Great Britain and Ireland at its meeting in July, 1924. In all three the coccus was found in the circulating blood during an illness closely resembling in its course that of the case under discussion—i.e., a subacute fever with temperature never rising above 101° F., without localising signs and ending fatally in three to four months. Post-mortem examination of one of the three, a boy of 17, showed endocardial vegetations on the right side of the heart. The other two were men of about 40 years of age on whom no autopsy was made. The serum of one of them tested by Dr. Clarke against his own strain of *S. mutans* and against other strains isolated from carious teeth agglutinated all of these equally in a dilution of 1 in 2000.

There can thus be no question that *S. mutans* (Clarke) is capable, probably under special conditions of heart strain, of attacking the endocardium, producing a subacute inflammation there and consequent death by septicæmia. Clarke's contention that this streptococcus is the chief bacterial cause of dental caries may still be disputed, and further data on the subject ought to be obtained by dental bacteriologists. The few observations which I (W. M. S.) have been able to make on this point tend to support Clarke. Of 12 teeth in various stages of caries which I examined 11 gave more or

less abundant colonies of a streptococcus behaving in identical fashion in culture and serological reactions with the strain isolated from endocarditis. In four of the teeth in which an early stage of infection of the pulp existed, the pulp cavity contained this streptococcus in pure culture; in one it was mixed in almost equal numbers with a *Streptococcus viridans*. It is evident that the carious tooth harbours *S. mutans* in a very high percentage of instances and that, whether or not it is the cause of the caries, it is capable of infecting living tissue.

Comment.

Sir James Mackenzie [2] noted that "a child with an impaired heart is not likely to injure it by over-exertion. Children are very sensitive to distress provoked by cardiac insufficiency and will themselves abstain from undue effort without being told; when they exert themselves and find pleasure in doing so, it may be taken for granted that no harm is being done." This boy was under observations for 18 years; during the whole of that time there was neither sign nor symptom to indicate that his disease was progressive. Compensation was as good at 18 as it had been at 6. In spite of the great hypertrophy of the ventricles, there is nothing to suggest that he had even begun to encroach upon the reserve power of his heart. He was not cyanosed, and he never became dyspnœic. It seems absolutely certain that no improvement of his condition could possibly have been obtained by irksome restrictions designed to spare his heart. There are only two things to be done for the subjects of congenital heart disease. The first is to use every effort to protect them from sepsis, and the second is to find out how much they can do, and let them do it.

Two points in this case are of outstanding interest and importance:—

1. The infecting organism, *S. mutans*. This is believed by Clarke to be the cause of dental caries, and was found by him in three cases of subacute infective endocarditis. It will be observed that we cannot claim to have isolated this organism from our patient's mouth, though we think it probable that it was present in the diseased tooth and was overgrown by other organisms on culture.

2. The nature of the cardiac lesion, subpulmonary stenosis. The imperfect union of the infundibulum with the right ventricle was fully described by Sir Arthur Keith [3] in his Hunterian lectures in 1909, and according to him this anomaly is responsible for more than half the cases of congenital heart disease. Dr. Maude Abbott,[4] writing of conus deformities, considers them "probably the commonest of all cardiac anomalies." No one would reach this conclusion from reading text-books, and we submit that the subject would be greatly simplified by reserving the adjective "pulmonary" for the rare cases of stenosis at the valve, which are probably of inflammatory origin, and by applying the adjective "subpulmonary" to the common cases of stenosis in the conus, which are certainly developmental errors.

We wish to acknowledge very gratefully the immense assistance we have received from Sir Arthur Keith in the preparation of this note.

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TORBAY HOSPITAL.—The new Torbay Hospital, which has cost nearly £150,000, received its first patients last week, although it has not yet been opened formally. The hospital, which stands in some 14 acres, commands views from almost every window of Torbay on one side and to Dartmoor on the other. It is the gift of Mrs. Rowcroft, of Torquay, a member of the Wills family.

Clinical and Laboratory Notes.

THREE CASES OF DEATHS UNDER ANÆSTHESIA.*

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With Post-mortem Notes by

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THE following cases are unusual and instructive:—

On Feb. 16th a girl, aged 5, was operated upon at the Royal Hospital for Sick Children for an acute abdomen and was given gas and oxygen with local infiltration of novocaine and adrenalin. Nothing abnormal was noted during the anæsthesia, which lasted 30 minutes. The abdominal condition was found to be a pneumococcal peritonitis, and antipneumococcal serum (Type I.) was given daily intravenously in doses ranging from 25 c.cm. on Feb. 17th to 50 c.cm. on the 25th, without any incident.

On March 4th another injection was given and this was immediately followed by temporary collapse, apparently directly due to the serum, of which 40 c.cm. had been given intravenously. As there was no improvement in the general condition of the patient the surgeon decided to do a blood transfusion; this was done in the theatre on March 9th; the father was the donor and 250 c.cm. of blood were taken. The child had been prepared for a general anæsthetic, but it was not anticipated that she would require one. Local infiltration with ¼ per cent. novocaine and adrenalin was done. The vein was exposed just above the right elbow and the cannula introduced.

After about 50 c.cm. of blood had been transfused she became restless and cried out as if in pain. This restlessness increased without any clinical signs of danger to the patient, and the surgeon suggested that I might give her some gas and oxygen. Nitrous oxide 4 parts, oxygen 2 parts was given without any positive pressure. The transfusion continued. The restlessness and moaning ceased, but the pulse increased in rate and became weaker, while the respirations were rapid and shallow and the child was in obvious distress. The nitrous oxide was discontinued and I went on administering oxygen passed over ether, but it became plain that the child—in distress and very ill before starting transfusion—was in extremis. Transfusion was discontinued 20 minutes after the introduction of the cannula, and after 150 c.cm. of blood had been passed. At this stage the respirations were rapid, shallow, and gasping. There was slight cyanosis and the pulse was just perceptible in the carotid artery.

Treatment consisted of: 1. Artificial respiration with oxygen and ether. 2. The administration of 10 minims of pituitrin subcutaneously. The heart-beat and respiration ceased 35 minutes after the commencement of the transfusion. 3. Atropine, gr. 1/100, was injected into the heart muscle. 4. Cardiac massage was done through the abdomen. There was no response to treatment.

My own impression of this case at the time was that we were dealing with an anaphylaxis.

Post-mortem Notes (Prof. Shennan).—1. Generalised peritonitis with pus in the abdomen. 2. Liver and kidneys were congested and showed toxic changes. 3. The spleen was enlarged and showed necrosis. 4. The heart was pale and its cavities dilated, especially the right side. 5. Both lungs were congested and the lower lobes of both were collapsed. 6. There was an excess of watery fluid in the membranes over the surface of the brain and in its tissues.

Conclusions.—1. Death was due to heart failure. 2. The restlessness shown by the child while transfusion was proceeding indicated that interference with the heart's action had already begun before the general anæsthetic was administered. 3. This restlessness was probably due to the inability of the heart to propel the additional amount of fluid transfused. 4. Probably the oxygen rather assisted the heart and prolonged life for a short time. 5. The general anæsthetic probably had nothing to do with the fatal issue.

CASE 2.—A female, aged 57, had been under observation for 48 hours with abdominal pain, which had subsided. Some 12 hours before operation the abdominal pain returned.

* Two of the cases were recorded at a meeting of the Scottish Society of Anæsthetists held in Aberdeen.

On the morning of the day of operation the temperature was 98·6° F., the pulse 84, urine normal, and blood pressure 140/90. There was no clinical evidence of sepsis.

The patient was extremely fat, and the surgeon suggested gas and oxygen with spinal analgesia. A hypodermic injection of morphia, gr. 1/6, and atropine, gr. 1/100, was given, anæsthesia induced with gas and oxygen, the patient turned on the side, and 0·7 c.cm. of light stovaine injected between the second and third lumbar vertebræ. Gas and oxygen with a trace of ether was continued. The operation was commenced ten minutes after the injection of the stovaine. The abdominal muscles were completely relaxed, and it was evident that the spinal injection was acting with unusual rapidity and potency. There was no tilting of the operating table. Twenty minutes after the injection of stovaine the pulse was 100 and the systolic blood pressure had fallen to 90 mm. of mercury. The surgeon had opened the abdomen and had found an acute diverticulitis with pus and general peritonitis. At this stage the patient had respiratory distress and slight cyanosis, apparently due to depression of the respiratory centre in the medulla, for there was no evidence of respiratory spasm or obstruction of the airway. The respirations were slow and shallow while the pulse was rapid and feeble.

The surgeon was requested to cease intra-abdominal manipulation, ½ c.cm. of pituitrin was injected subcutaneously, and oxygen passed over ether was continued. Some improvement followed and the surgeon proceeded to close the abdomen. The respiratory distress recurred, with cyanosis and very feeble pulse. Artificial respiration was done and oxygen given through the nose. Respiration completely failed 30 minutes after the commencement of the operation, and this was immediately followed by failure of the heart. Cardiac massage was done through the abdomen, and artificial respiration continued, but there was no response.

My own impression of the case at the time was that we were dealing with a depression of the vital medullary centres in a very toxic patient.

Post-mortem Notes.—1. There was a considerable amount of purulent material over the intestines, which were much distended. The other organs in the abdomen showed toxic changes and venous congestion. The lungs were extremely congested and the bases showed partial collapse from pressure upwards of the abdominal contents. 2. The heart was dilated in all its chambers, especially on the right side. The walls of all the chambers showed distinct toxic changes and the right ventricle wall was largely replaced by fat. 3. The spinal cord showed extreme congestion of the veins and some œdema. The brain showed some general congestion, and the substance was dropsical.

Conclusions.—1. Death resulted from heart failure. 2. Probably the injection of stovaine along the spinal cord may have had an influence in producing this, by extension of its action up to the higher centres. 3. An important factor in bringing about the heart failure was the marked replacement of the heart muscle by fat and the toxic poisoning resulting from the condition present in the abdomen.

CASE 3.—A female, aged 22, whom I was asked to see by the surgeon with a view to giving an anæsthetic for the removal of a foreign body; this had been located by X rays well down the right main bronchus. I was informed that the right lung was out of action and that there was a history of rheumatic heart disease, probably with fresh involvement from the present illness, but that unless the foreign body, which had been in this position for some weeks, could be removed, the patient must die. She was obviously very ill. Temperature 101° F., pulse-rate 128, respirations 40. Rigors, followed by profuse perspiration, occurred at intervals. Cough was very troublesome, with expectoration of large amounts of purulent material.

It was agreed by the physician, surgeon, and anæsthetist that a general anæsthetic should be given and that the easiest and safest type of anæsthesia in the circumstances was rectal oil ether. The same evening gr. 1/100 of atropine was given subcutaneously, followed by a second dose at 11 o'clock the next morning. At 2 P.M. a morphia suppository, gr. 1/8, was introduced into the anus. At 3 P.M. the patient was taken to the theatre and placed upon the operating-table, slightly on her left side with the legs drawn up. A small-sized œsophageal rubber tube was passed well up into the rectum and 6 oz. of oil and ether in equal parts slowly introduced. At 3.20 P.M. she was drowsy and allowed me to pass a fine rubber tube through the nose. A continuous stream of oxygen was given through the nasal tube. At 3.25 P.M. her colour was good, surgical anæsthesia was approaching, her jaw muscles were slightly relaxed, and her respiration rapid but easy. At 3.30 P.M. she was turned on to her back and her head lowered, in preparation for the surgeon.

Suddenly and without cough or warning the respiration ceased and cyanosis supervened. In anticipation of such a contingency an endotracheal catheter was ready. Without delay it was passed into the trachea and attached to the oxygen cylinder. Oxygen under pressure and artificial respiration were continued and adrenalin injected into the heart muscle without response on the part of the respiration or circulation.

Post-mortem Notes.—On removing the lungs it was found that the right lower lobe was solid from inflammation, and there was evidence of recent hæmorrhagic pleurisy with a collection of 10–12 oz. of brownish fluid. On slitting up the windpipe and bronchi the tip of the instrument came in contact with and dislodged the foreign body in the main left bronchus. It was evident that it had not been in this position for long, because there was no roughness of the surface where it had lain, no congestion, and no inflammatory change of any kind. Furthermore, there was no evidence of obstruction of the intrapulmonary air passages below where it was found, and no inflammation of the lung. On the other hand, on opening up the air passages on the right side, the main bronchus and its branches were seen to be deeply congested, and where the secondary bronchus to the upper lobe passed off from the main bronchus there were two small tears in the wall about an inch below the commencement of the main bronchus of that side. These ulcers showed very marked inflammatory reaction, and below this point the air passages were full of yellow-grey pus. Further, the whole of the lower lobe was solid from pneumonia and much of it was soaked in pus, abscess formation being well established. The upper lobe was partly collapsed and was not consolidated. The heart was about normal in size, but on the left side there was well-marked subacute rheumatic endocarditis of the mitral valve.

Conclusions.—1. The cause of death was sudden mechanical interference with the respiration and heart failure. 2. Deceased suffered from acute suppurative pneumonia, from which recovery was hardly possible in any case. 3. This was a direct consequence of the inhalation of a foreign body into the right bronchus, setting up local ulceration and infecting the lung. 4. During anæsthesia the foreign body had been dislodged from its position in the right bronchus and had passed into that on the left side, causing spasm and obstruction of the passages to the left lung, which alone was available for breathing.

Discussion on the Three Cases.

It is a matter for serious reflection that an error in judgment regarding the patient's condition or in the choice of the anæsthetic, on the part of either the surgeon or the anæsthetist, may lead to disaster.

In the first case either 150 c.cm. of additional fluid to the circulation was more than the heart could contend with under the abnormal circumstances, or else the transfused blood produced an anaphylaxis.

In the second case fatty degeneration of the cardiac muscle and general toxæmia so depleted the patient's resistance that 0·7 c.cm. of stovaine depressed the vital medullary centres beyond recovery. Sepsis is a contra-indication to spinal analgesia.

The third case demonstrates that in dealing with a foreign body in the respiratory tract the patient should be placed on the table in position to suit the surgeon and not moved in any way after the commencement of the induction of anæsthesia.

A CASE OF PNEUMOCOCCAL MENINGITIS, WITH RECOVERY.

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(*With a Note by* Dr. A. G. GIBSON.)

ATTENTION has recently been drawn to the fact that the prognosis of pneumococcal meningitis is less grave than was formerly supposed. In America, Globus and Kasanin[1] and Harkavy[2] have each reported cases of recovery and have collected nine cases from the literature. Further cases are recorded by Gould,[3] Simpson,[4] Cautley.[5] These cases were reported in the following years:—1904, 1 case; 1905, 1; 1910, 1; 1912, 1; 1915, 1; 1916, 1; 1919, 1;

1920, 1; 1925, 2; 1926, 1; 1927, 1; 1928, 2. A further case in 1928 is reported.

Mr. X., a benchman of 26 years, had a shivering attack, felt ill, and went to bed on March 13th, 1928. He got up on the following day, but feeling poorly he soon returned to bed where he remained up to the time of his admission to the Radcliffe Infirmary on March 30th. Dr. E. L. Elliott, of Stokenchurch wrote: "His temperature has fluctuated, frequently being about 103° F.; pulse slow in comparison with temperature; photophobia and drowsiness; Widal negative on March 28th."

The patient stated that he had been suffering from pain across front of head and down the neck, and upper part of the back. The pain came on chiefly at night, at which times also he sweated profusely. He had no recurrence of the shivering attack. Vision had deteriorated since the illness started, and distant objects occasionally appeared double. His legs felt rather stiff, but not particularly weak. He was constipated but had not vomited. Sleep was poor. On the whole he felt better than at the onset of the illness.

The patient was ill; he could answer questions but was in some distress from the discomfort in his head. The temperature was 102·8° F., and the pulse-rate 108. Examination showed some rigidity of the neck muscles. The head could not be bent forward and lateral movement was somewhat limited. He could bend it back fully. There was tenderness on firm pressure over sixth and seventh cervical spines and over those of the lower thoracic vertebræ. The pupils were small and somewhat irregular in outline, and there was slight nystagmus to the right. There was stiffness of the legs, especially the right. Kernig's sign with the right leg was doubtful, with the left it was absent. The abdominal reflex was more marked on the right than the left. No disease was detected in the thorax or abdomen. There was no ear discharge and no tenderness indicative of disease of any of the sinuses.

Note by Dr. Gibson.

The fluid was examined by me in the ordinary course of laboratory routine. There were pus cells in moderate numbers in the deposit which settled in the tube, and careful search revealed a small number of typical pneumococci. Unfortunately no culture was made at the time and a subsequent lumbar puncture, when the patient was convalescent, showed a few pus cells only and no organisms either in the stained slide or in culture. My opinion is that this case, both clinically and from the morphological characters of the organism, is correctly described as one of pneumococcal meningitis, mild in type, in which recovery occurred. It formed one of a series of pneumococcal infections which in the winter of 1927–28 has constituted a small epidemic in the district. The following table shows the number of pneumococcal infections of the serous membranes in the last five years:—

	Pneumococcal—	
	Meningitis.	Peritonitis.
1923	0	3
1924	1	1
1925	1	0
1926	0	2
1927	4	4

The patient was given on the second, third, and fourth days following his admission to hospital 20 c.cm. of Messrs. Allen and Hanbury's mixed pneumococcal serum intramuscularly. The temperature on the second day of admission was 102·8° F. on two occasions. After the first injection the temperature was never above 100° and gradually fell to normal in 16 days. All physical signs of disease had disappeared by April 6th, though occipito-frontal headache continued until April 13th. The patient has now fully recovered.

I am indebted to Dr. Gibson for permission to publish this case.

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NOTE ON AN OUTBREAK SUGGESTING EPIDEMIC JAUNDICE.

BY W. S. RUSSELL THOMAS, M.B. CAMB.

SEVERAL cases of jaundice among children occurred in my practice in the months of May, June, and July of this year. In view of the fact that one of the cases was fatal, and the whole number taken together suggested a small epidemic, the following description may be of interest:—

In June I was called to see a boy, aged 7, who was reputed to have "yellow jaundice." He was apparently suffering from catarrhal jaundice, his mother telling me that he had been in that condition for about ten days to a fortnight, the attack being ushered in by loss of appetite, feeling of sickness, and constipation, followed a few days later by yellow colouring of the skin and conjunctivæ, with large light motions and dark-coloured urine.

Examination showed a furred tongue, moderately yellow skin and conjunctivæ. The temperature was subnormal, 97·6° F., and the pulse 60, regular, slow and full. The heart and lungs were normal, but the edge of the liver was felt about 1 in. below the right costal margin. The spleen could not be felt. The motions were large, light, and pultaceous, and the urine had the colour usually associated with catarrhal jaundice. There was no albumin in it.

A week later the boy's colour had deepened to a dark nut-brown; his nose had bled two or three times, and his lips were extremely pallid. The temperature was still subnormal, the pulse still slow, full, and regular. The colour of the urine was deeper. The edge of the liver could be felt quite easily, and was 1½ inches below the costal margin. The spleen was not enlarged. There were no other physical signs. Normally not a bright boy, his intelligence now suggested the mentally defective. He was sluggish, inclined to be drowsy, and slow to answer questions, and took very little interest in his surroundings. He did not seem to appreciate fully simple questions which a boy of 7 would be expected to appreciate.

About midnight a few days later I was called to see the child because his parents "could do nothing with him." He was said to have been yelling and screaming in spasms for some hours. I found this to be no exaggeration; he was shouting loudly and incoherently; he threw himself violently about the bed, and frequently made fearful noises. This lasted about five minutes or so, then he flung himself suddenly on to his pillow and appeared to be semi-conscious. The lull was not of long duration, but sufficiently long to allow of examination. After the calm the delirium began as markedly as before, accompanied at times with vomiting. Examination showed bright and widely dilated pupils. The heart was slightly dilated, and the pulse was thin and rapid. The lungs gave no physical signs. The liver, however, which hitherto had been so easily palpable, could now only just be felt below the costal margin. I could feel no enlargement of the spleen.

The delirium continued, off and on, for at least 24 hours, alternating with short periods of restless sleep. The boy then sank into coma, the pulse became irregular, and the heart more dilated. The liver was no longer palpable, and the note for about one to two inches above the right costal margin was tympanitic. This rapid shrinking of the liver was very striking. Death took place within a few hours.

During the course of this case, and for about one month afterwards, six more cases of jaundice in children, both boys and girls, ranging from 4 to 14 years of age, came to my notice. These cases were apparently harmless, lasting about three weeks to one month—i.e., from the earliest symptom until the patients could be said to be quite well. The onset in each was marked by loss of appetite, furred tongue, and constipation, and a few days afterwards the yellow colour set in, ranging from a tinge in one to a bright yellow in others.

I should mention that these children went to the same schools, all lived near one another—two in the same house and within two or three doors of the fatal case. There were, I am informed, two or three other cases within a radius of one and a half miles of the fatal case. No history of improper food or drugs was given, nor had these children any other disease.

All this is, I think, strongly suggestive of epidemic jaundice.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF ORTHOPÆDICS.

THE opening meeting of the session was held on Oct. 2nd, when the new President of the Section, Mr. NAUGHTON DUNN, delivered an address on the

SURGERY OF MUSCLE AND TENDON IN RELATION TO INFANTILE PARALYSIS.

He said that the principles relied upon for the treatment of infantile paralysis were recorded in the text-books on orthopædic surgery, and his reason for devoting an address to the subject was that so many alternative treatments were advised that it could only be helpful to review these in the light of personal experience. He wished specially that the discussion should deal with the part played by muscle in the causation of deformity and restoration of function. During the acute illness any treatment of the muscles other than by rest, with the prevention of postural deformities, was generally recognised as harmful. The spinal column and limbs should be immobilised in the positions which would prevent overstretching of the weakened muscles, and also ensure that the position of the joints was the one most useful to the patient, whatever the final degree of paralysis. During convalescence the control of treatment was more difficult; the weakened muscles were like delicate plants in a greenhouse, which required for their development all the skilled care of the gardener. The degree of ultimate recovery would largely depend on the treatment of the muscles paralysed, and too often massage, electrical treatment, and re-education were practised without it being clearly recognised that the only muscles requiring this attention were the paralysed or weakened ones. Weak muscles must be constantly protected, nurtured, and re-educated, with the avoidance of fatigue, while the healthy muscles were allowed to atrophy as much as possible from disuse. The child must be kept recumbent or supported until the surgeon was satisfied that an erect position of the spinal column could be maintained by muscular power. Patients suffering from weakness of the spinal or gluteal muscles sometimes required six or even 12 months of carefully supervised treatment of the weakened muscles before the upright posture could be allowed.

Splintage seemed to be necessary in all cases of infantile paralysis, and the question arose as to when splints could be dispensed with. Splintage to prevent overstretching of the weaker muscles should be continued until there was evidence that further weakening of the affected muscles would not occur if freedom was allowed. The indication for the relaxation of splintage was the patient's ability to maintain the limb in the position which splintage ensured.

The Correction of Established Deformity.

The orthopædic surgeon, continued the President, usually saw the patient for the first time long after the initial stages were past, and at no stage was more patience and judgment in treatment of infantile paralysis needed, for muscular control of the limb was already deficient, and divided tendons and muscles quickly underwent further shortening and atrophy. Division or elongation of a tendon or muscle for the correction of deformities in infantile paralysis should be resisted unless the surgeon was satisfied on the following points: (1) that correction of deformity would improve function; (2) that division or elongation of tendons was necessary for the correction of deformity; (3) that the power of the shortened muscle or tendon could not be utilised by tendon transplantation at the time of operation. Dealing with the deformities which commonly follow infantile paralysis, he gave the result of his own experience. In a general way, he said, the prominence given in text-books to operative methods gave the feeling that the specialty might become too surgical. The value of modern methods could only be assessed in the light of the possibilities of correcting deformity by gradual splintage. He was himself trained in a school in which gradual correction of deformity gave strikingly successful results. He had learned that nature resented tension and gradually permitted relaxation of structures to which it was constantly applied. His own experience was that operation was seldom necessary for the correction of flexion-contracture of the hip in infantile paralysis.

When marked spinal lordosis was present the method used by Dame Agnes Hunt at the Shropshire Orthopædic Hospital was valuable. The principles of the method were three: (1) The correction of lordosis by flexion of both hips while the spine and one flexed hip were immobilised in plaster-of-Paris. (2) The free limb was then fixed in a Thomas knee splint, which was gradually lowered as the tight structures yielded to extension and gravity. (3) The limb in which deformity had been corrected was then incorporated in plaster with the spine, while the other limb was gradually extended.

Tenotomy and tendon lengthening were seldom necessary for the correction of deformity of the hip and knee, and in the case of foot deformities also the temptation should be resisted. The literature of tendon transplantation was so confused that while it easily explained all the failures, it also made the methods which were depended on for success more worthy of publication. He contended that the operation of utilising tendons as ligaments to limit joint movement had a definite value in infantile paralysis. His own practice was to suture tendons under considerable tension, and he did not consider it essential that, even in the foot, the point of insertion should be periosteum or bone. He often employed tendon fusion of the anterior tibial muscles in preference to transplantation of an individual muscle in cases of weakness of the anterior tibial group.

Conclusions.

Mr. Dunn set out his main conclusions under the following four heads:—

1. That the most important period in the treatment of muscles weakened as a result of infantile paralysis was the acute illness, and if necessary a prolonged convalescence.
2. That division of tendons or muscles was seldom necessary for correction of deformity.
3. That successful transference of muscle power to a new insertion, given good surgical technique, was dependent mainly on recognition of the group action of muscles.
4. That tendon transplantation should always be helpful, but would seldom, by itself, produce spectacular success in the restoration of function in infantile paralysis.

Discussion.

Mr. T. H. OPENSHAW said he had not been able to satisfy himself that in a single case of the many he had dealt with the peroneus longus had become active as an inverter of the foot. He agreed with the President, too, that the transference of the biceps into the quadriceps was not a success.

Mr. R. C. ELMSLIE said he felt that the President had emphasised in this address the principles which should be in the minds of those who were engaged in teaching. He had also insisted that the various methods of tackling these problems must be combined suitably. The surgeon should, in fact, draw up a programme of procedure in each individual case; each process should be considered in relation to the others, and not as a separate entity. In transferring tendons it was necessary to decide whether the tendon chosen for carrying out the new function was capable of it. He intended to operate on these cases less frequently in future.

Mr. HARRY PLATT (Manchester) expressed his particular agreement with the President's remarks on the subject of flexed hips. Like Mr. Elmslie, he felt

that he had operated too often in the past, though not in the immediately preceding five years. He now thought that operations for even the most extreme deformities in poliomyelitis were unnecessary, though later on some form of tendon transplantation in the hip might help the gait and general function of the patient. Though admittedly it was desirable to reduce the problem of transplantation to one of simplicity, it was not wise to ignore some of the minutæ in the transplantation technique, as they had a great bearing on the success of the various operations.

Mr. G. R. GIRDLESTONE said his feeling was that in the treatment of infantile paralysis there had been too much tendency to try to put the foot at right angles. Most of these cases had two complications—a short leg and a weak or a paralysed quadriceps. A somewhat tight tendo Achillis did no real harm if the person had a short leg, because the heel could ultimately be raised to correspond. In infantile paralysis one should avoid putting the foot up at a right angle. A weak dorsiflexor group could be got over by lifting the foot an extra height in walking. The most crippling paralysis was that of the gluteus medius, and he would have liked to hear what was the President's practice in regard to replacing this muscle.

Mr. H. A. T. FAIRBANK asked what steps Mr. Dunn took in regard to the after-treatment for flexion of the hip. He, the speaker, admitted he had operated unnecessarily for this condition. He had found he had to use hyperextension of the hip at night for a long time afterwards, so as to ensure against recurrence of flexion. In tendon transplantation he had felt for many years that the selection of the suitable tendon for transplantation was far more important than anything else. A fairly general mistake seemed to be not putting enough tension on the grafted tendon. For some years he had put a good deal of tension on the tendon; then, if the suture held, the result was far better. The tendon he most often grafted was the extensor hallucis. He spoke favourably of combining arthrodesis with a tendon transplantation operation.

Mr. MITCHELL SMITH spoke gratefully of having come under the influence of the school which the President represented, remarking that nowadays there was a great tendency to get back to making corrections by surgical procedures.

Mr. W. ROWLEY BRISTOW asked the President's experience on tendon transplantation about the shoulder, especially for paralysis of the deltoid. To the speaker arthrodesis of the shoulder in infantile paralysis did not appeal in the same way as it did to some others. He took up a defence of the position of bringing about a quick correction of deformity as against gradual correction, though the President had the great advantage of a special team at Baschurch for the carrying out of the latter. He did not think such good results as Mr. Dunn had detailed could be obtained without a specialised staff such as the President was fortunate in possessing. He wondered whether Mr. Fairbank, Mr. Elmslie, and others who declared their intention of using gradual correction more would take the same attitude a few years hence. The clear enunciation of leading principles in this address would prove very valuable to those practising the specialty.

Mr. B. WHITCHURCH HOWELL said that many of the failures had been due not so much to lack of muscle balance or of anatomical alignment of the new tendon as to lack of splitting up of the muscle near its origin, so as to get a muscular pull as well as a tendinous pull. Also, orthopædic surgeons had been brought up to stimulate these transplants rather late in the operation. He was taught to transplant at the end of the sixth week after the operation, but he had beneficially reduced the time to three weeks, and then to four days. He would like to hear more detail on the after-treatment of tendon transplantation, especially in paralysis of the upper limb, which was more important than that of the lower.

The PRESIDENT, in the course of a detailed reply, said that the main feature in the later success of tendon transplantations of musculo-spinal paralysis of the wrist was that at the Shepherds Bush clinic they got to understand the tension under which the transplanted tendons should be sutured. He had had no experience of tendon transplantation of the shoulder which had been effective. With regard to Mr. Bristow's advocacy of quick correction of deformity, the absence of a specially skilled staff should not prevent the recommendation of the best method. He knew of no successful transplantation or treatment by splintage apart from fixation of the hip-joint in cases in which the gluteal muscles were severely paralysed, and that was the reason he emphasised the importance of gradual correction of deformity in flexion contraction of the hip-joint, rather than sacrificing the gluteus medius by rapid correction.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are some of the 1927 statistics of three of our largest cities:—

Name of city and estimated mid-year population.	Birth-rate.	Death-rates per 1000 of the population. All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Death-rates per 1000 births. Infant and neonatal mortality.	Diarrhœa, &c., under 2 years.	Maternal mortality from childbirth.
Birmingham (951,100)	18·1	11·7	1·07	1·38	2·3	1·8	75/33	11·5	3·6
Manchester (764,420)	17·1	13·8	1·38	1·42	3·5	1·5	86/35*	11·3	4·8
Sheffield (524,900)	16·2	12·3	0·89	1·39	2·6	1·7	91/40	8·1	7·3

* Approximate figure.

The death-rates per 1000 births among children over 1 and under 5 years of age add to the interest of the above comparison. They are Birmingham, 34; Manchester, 55; and Sheffield, 50.

Birmingham.

Dr. H. P. Newsholme, whose service in Birmingham only began in 1928, draws special attention to the distribution of mortality during the early weeks of infancy. Figures are given which show that the mortality from stillbirths and during the first week of life is equally heavy in the central wards and the wards of the middle and outer rings, and that it is not dependent on social conditions, being as high in the residential wards of the city as in the poorest areas. The neonatal mortality is not being seriously reduced. It was higher in 1927 than in 1926, and investigation shows that it is not appreciably affected by the factors which influence infant mortality after the first month. Of 471 deaths occurring during the first two weeks of life 281 were classed as from prematurity, 19 from birth injuries, 18 from convulsions, 13 from congenital debility, 28 from atelectasis, 26 from congenital heart disease, and 19 from congenital deformities. "Everything goes to show," says Dr. Newsholme, "that only intensive antenatal work with its influence on the mother's health and with the consequent diminution both of difficult confinement and of injury to the child's health before birth will be of real value in reducing neonatal mortality." A further effort is to be made to help midwives to deal with premature and feeble infants by the supply of special prematurity outfits and by encouraging the midwives to invite help from the health visitors earlier in such cases. A special inquiry was conducted with regard to premature infants at the request of the Ministry of Health. The inquiry included 500 such cases. Of 136 born in institutions 52 were alive at the age of 12 months,

while of 364 born at home, 124 were alive at the age of 12 months. Of the 176 who reached the age of 12 months, 80 per cent. were healthy children. Of the 324 who died before reaching the age of 12 months, 288 died within four weeks of birth and 126 died on the first day. These last figures again emphasise, says Dr. Newsholme, the need for intensive antenatal work.

There were 521 stillbirths in 1927 as against 585 in 1926. The midwives' cases are investigated immediately, the other cases at the end of a fortnight. A second visit is paid at the end of six months, so that in case of pregnancy antenatal care may be urged. Several points emerged from the investigation of these stillbirths. The age of the mother was not significant, nor was the question of legitimacy. A high proportion was associated with prematurity. In 25 per cent. the fœtuses were macerated. In 22 per cent. the presentation was a breech. The history of the multiparæ showed that 40 per cent. had had previous miscarriages or stillbirths, and that the 309 mothers had had 678 abortive conceptions out of 1697 pregnancies. The antenatal clinics have been increased in number, and 28 per cent. of the expectant mothers attended. At the Carnegie Institute a special investigation as to the cause and treatment of anæmia in young children was undertaken. The barrier system of nursing at the Babies' Hospital, Witton, was found useful in preventing the spread of infection. At the municipal maternity home, of 357 cases admitted 26 came in for antenatal treatment and were readmitted for confinement. The births which occurred in institutions amounted to 24 per cent. of the whole. There are now 40 home-helps, who attended 327 cases. One large firm has arranged with the Health Department to guarantee the fees of the home-help for the confinement or non-infectious illness of the mother in the case of their workpeople. Of 214 notified cases of puerperal fever and pyrexia, 123 were removed to hospital; in 18 instances a consultant was provided under the regulations and in 5 cases a nurse. Since 1912 the Women's Hospital has been available for all these cases, and any Birmingham practitioner may thus have his puerperal sepsis patients removed into a hospital having a first-class staff of physicians and surgeons.

Mr. Brennan DeVine, F.R.C.V.S., reports that there were 1531 dairy cows in the city cowsheds at the end of the year, and that during the year 12 tuberculous cows were found in the city sheds and dealt with under the Order. Of these, 8 had tuberculous udders, 1 emaciation, and 3 "other signs." At the beginning of the year there were 22 herds, comprising 696 cows, in the special scheme for the eradication of bovine tuberculosis, and at the end of the year 21 herds, comprising 713 cows. At the half-yearly testings there were 1513 cows which passed the test and 373 which failed. The samples of mixed milk from outside sources examined for tubercle numbered 835, and 60 of these, or over 7 per cent., were found to be infected.

Manchester.

Dr. R. Veitch Clark says that Lancashire's special problem of mule-spinner's cancer is the focus of the special research work undertaken by the Manchester Committee on Cancer. The following are some of the results obtained. Cancer has been produced in mice by the application to the skin of petroleum lubricating oils actually used in cotton mills. The toxicity of this oil is not increased by use on the spindles. A shale lubricating oil was found to be much more carcinogenic than petroleum oil. A lubricating sperm oil appeared to be harmless. Treatment with sulphuric acid reduces the carcinogenic properties of some toxic oils. A synthetic tar has been prepared which is 30 times more carcinogenic than the ordinary lubricating oils used in cotton mills, thus giving "hope that we are on the track of the active carcinogenic agent in lubricating oils." Another discovery suggests that cancer would be less prevalent among workers engaged in making coal-dust briquettes if bitumen were used as a fuel-binder instead of pitch.

Towards the end of 1927 there was an outbreak of small-pox, with 36 notifications up to the end of the year and no deaths. It is intended to launch a scheme for the immunisation of children against diphtheria and, as a preliminary, on Oct. 1st, diphtheria prophylaxis was offered free of charge to any persons desirous of being protected. At the Monsall Hospital scarlatinal toxin has been used for scarlet fever convalescents who show a persisting positive Dick reaction, in order to prevent relapses. The results are claimed to be successful.

Dr. Clark comments on the persistence of the high maternal death-rate from childbirth. A table shows that the rate of 4·81 has to be compared with 4·58 for 1926, and that we have to go back to 1891–1895 to find a quinquennium with a higher rate than that for 1927. The admissions for puerperal sepsis to Monsall Hospital numbered 119 with 12 deaths, a case fatality of 10·1, which may be compared with a case fatality of 19·0 for 1926 and 15·2 for 1925. This satisfactory improvement has occurred in spite of the admission of a large number of severe cases late in the disease. The average day of disease on admission was the fifth. The treatment by lymph drainage of the uterus has not been so extensively employed, as different standards have been adopted in selecting the cases suitable for this treatment. In view of the unsatisfactory position of the mortality from childbirth, Dr. Clark emphasises once more "the need for a greater development of our antenatal work in conjunction with our medical practitioners and midwives on the one hand and the larger maternity institution on the other."

There were 65 cases of encephalitis lethargica notified, and there were 37 deaths from this disease, 12 of which were of persons notified in previous years. Representatives of the guardians and the Education and Public Health Committees are to consider a joint scheme for the institutional treatment of survivors from this disease. Success is reported from the intravenous injection of highly concentrated antidiphtheria serum in severe and laryngeal cases of diphtheria. The trial on a small scale of convalescent serum for the prophylaxis of measles has also been successful. Of 171 cases of ophthalmia neonatorum, two cases were blinded in the eye and one was blinded in one eye with the other eye damaged. Lieut.-Col. J. W. Brittlebank, M.R.C.V.S., comments unfavourably on the administration of the Tuberculosis Order, and points out that the percentage of tuberculous milk was 11·1 as compared with 10·3 in 1926. Last year there were 61 city farms with accommodation for 1179 cows, and among these one case of tuberculosis of the udder was found. In 1927 the city farms were reduced to 53, owing to the spread of housing estates and the lack of grazing, and on these 53 farms with available accommodation for 1016 there were housed 823 cows. No case of tuberculosis of the udder was found among them during the year. It is of interest to compare these results with the experience of Birmingham and Sheffield. In Birmingham the city cow-sheds, with accommodation for 1531, furnished 8 cows with tubercle of the udder, while the Sheffield city cow-sheds, with accommodation for 2307, furnished 23 cows with tuberculous udders. Furthermore, the experience of Sheffield for a long period has been that 100 cows' stalls will supply, on an average, about one tuberculous udder per year.

The Regional Smoke Abatement Committee has been reconstituted as an advisory committee, which has been joined by 72 of the 102 authorities in the area, with a population of 2,761,900. The 30 non-joining authorities had a population of 417,200. Three important matters considered by the committee were the "patrol system of inspection," the "standard definition of black smoke," and "the time concession." Dr. Clark thinks that by instituting the adoption of a uniform standard of administration

and by-laws this advisory regional committee will exercise a great influence for good.

Sheffield.

Dr. F. E. Wynne says the most important event of the year was the increased prevalence of small-pox. During 1924 there were 4 notifications, during 1925 44, during 1926 157, and during 1927 667. The peak was reached in January with 316 cases. During the next five months the numbers were 155, 64, 29, 30, and 20. During the second half of the year the monthly average was about 10 cases. The accommodation for contacts, while their houses were being disinfected and cleansed, had to be increased. Much work in the confirmation of diagnoses fell on the medical staff, who received temporary assistance during January and February. It is estimated that since 1925 about 100,000 persons have been vaccinated, mainly in the infected areas of the eastern part of the city. The suggested association of vaccination with encephalitis caused anxiety, seeing that Sheffield was one of the areas most seriously affected by encephalitis in 1924, when there were 300 ascertained cases. Charts are given in the report, showing the incidence of small-pox and of encephalitis during recent years, and the amount of vaccination practised corresponded closely with the cases of small-pox notified. The charts do not indicate the slightest association between the incidence of encephalitis and vaccinia. The only death attributed to small-pox was that of a male baby in the fourth week of life. The new houses certified during the past four years were 1061, 2178, 2714, and 1897. Of the last-mentioned 1897 723 were erected by the corporation. Dr. Wynne says that "the amount of overcrowding continues to be deplorable," and that it is still impossible to close houses which are unfit for habitation and ought to be condemned. Three small condemned areas, involving 173 houses, have been cleared and the tenants removed to Wybourn estate, and an area of 126 houses was condemned in May, 1928. The new premises for maternity and child welfare work were opened in October by the Minister of Health and provide "ample accommodation for this most essential work, including the rapidly extending prenatal work for many years to come." The accommodation in the new maternity block at Nether Edge Hospital, opened in March, has also been much appreciated.

In April Sheffield and Rotherham coöperated to form the first statutory joint committee under the Smoke Abatement Act of 1926. The staff of smoke inspectors has been increased and several important conferences have been held with the Sheffield and District Engineers Employers' Federation. It is hoped that the work of this joint committee will shortly be linked up with that of other joint committees in the West Riding, and a common policy for smoke prevention established over an enormous industrial area with the cordial coöperation of employers of labour and local authorities. The commercial development of smokeless fuel for domestic and other purposes is being followed with great interest.

Sheffield's death-rate from tuberculosis in 1927 was less than that of England and Wales and also less than that of any of the towns with populations exceeding 200,000. The report of Dr. John Rennie, the tuberculosis officer, shows that, out of 1762 new notifications of tuberculosis of the lung, tubercle bacilli were found in the sputum in 19·2 per cent., and that a large proportion of the remaining 80·8 per cent. were notified in the early and curable stage of the disease. That the dispensary is well used for diagnostic purposes is indicated by the fact that 2584 suspects were sent up. The number of contacts examined was 1643. A table giving the interval between notification and death of the 354 cases of pulmonary tuberculosis which ended fatally in 1927 shows that death occurred within a year in over 55 per cent. More than 15 per cent. died in the second year, and 27 cases, or 7·6 per cent., had lived for six years or more after notification. Of these last 27, 16 had had tubercle bacilli found in their sputum, as follows: in three cases 5 years before, in four cases 6 years, in two cases 7 years, in three cases 11 years, and in one case each 12, 16, 20, and 24 years before. It was noteworthy that the recorded deaths were about equal in number to the notified cases with T.B. in their sputum, and that in 75 per cent. of the deaths the diagnoses had been confirmed by the finding of T.B. in the sputum. The beds available for pulmonary tuberculosis have been increased to 505 by the provision of 47 beds for women at Nether Edge Hospital. Dr. C. Lee Pattison, the surgical tuberculosis officer, shows that the children treated at King Edward VII. Hospital are being admitted at an earlier stage of the disease and need less prolonged treatment. Thus, in 1920 the number admitted was 75 and the average duration of stay of the discharged patients was 695 days, while in 1927 the number admitted was 168, and the average duration of stay of those discharged was 248 days.

PORT SANITARY AUTHORITIES.

Manchester Port.

Dr. W. F. Dearden, in his twenty-second annual report, mentions that no cases of cholera, plague, or yellow fever reached the port during 1927. Apparently 1 case of enteric fever, 3 of phthisis, 3 of tuberculosis, 19 of malaria, 1 of pneumonia, and 1 of scarlet fever came to notice in ships arriving. No notifiable diseases occurred in canal boats, but 4 cases of measles and 1 of suspected phthisis were discovered in one, and chicken-pox and whooping-cough in groups in others. On board ship 2245 rats were killed and 2476 ashore; 21 were examined and found free of plague; 28 ships were fumigated with sulphur dioxide (15 rats the average found on each); trapping killed 86 on one ship; most of the rats killed and identified on ships were brown. There were condemned 1½ tons of meat, 503 tons of vegetable food, including 378 tons of wheat and 103 tons of oranges. Among the 2168 vessels inspected, 580 (26·7 per cent.) had insanitary conditions, a slight increase. There were defects in 30 per cent. of British and in 14 per cent. of foreign steamers. Dealing with the general question of sanitation on shipboard, Dr. Dearden observes that while the ordinary workman has two sets of risks—occupational at his work and domestic in his home—for the seaman on duty 24 hours each day, all his risks are occupational, food, water-supply, and sanitary conditions included. A list of seamen's illnesses over ten years (apparently compiled from ships arriving at Manchester) is headed by infectious fevers, and it is noted, on the authority of the Registrar-General, that merchant seamen have almost twice the average liability to death from respiratory tubercle, and five times that from injury. Dr. Dearden remarks that since in our laws "not much printers' ink is wasted on ships' hygiene," the standard on British ships depends on the meaning given by the Board of Trade to the word "properly"—e.g., "properly ventilated," Merchant Shipping Act, 1894. Where Norway orders, we recommend. Dr. Dearden's chief complaint is of overcrowding, comparing the 120 cubic feet per man legal at sea, with the 300 required in common lodging-houses; dampness of quarters predisposes seamen to rheumatism, and the report shows that of 723 defects reported in the year, 93 involved this quality of dampness. He warmly approves the recommendations made by the Association of Port Sanitary Authorities in 1922 for the hygiene of crew spaces. Of these, No. 10 insists that the Board of Trade standard of lighting should be strictly adhered to; as a matter of fact, in the next year the Board reduced this standard by one-third. Dr. Dearden's valuable note on sanitation at sea deserves to be widely read.

Hull and Goole Port.

Dr. W. Allen Daley says that while more ships arrived in 1927, no cases of cholera, plague, yellow fever, small-pox, or typhus fever appeared. Sanitary

administration cost £4433, of which £2128 was covered by the Government grant, the remainder being borne four-fifths by Hull and one-fifth by Goole. The water-supply of the port is declared very pure, and the water-boats are kept in good order; 142 water-tanks in ships were ordered to be cleaned and this was done. It is observed that many ships have no proper record of the origin of the water in their tanks; the colon bacillus was found in three cases, twice in 5 c.cm., and once in 1 c.cm. Infectious cases go to the City Hospital in Hull, or to the Isolation Hospital in Goole, disinfection of the ship with 4½ per cent. formalin being carried out at once; later, should the diagnosis be confirmed, sulphur dioxide is used for additional security. A motor-ambulance is always available at the disinfecting station, where bedding and the like is dealt with, and where shelters are provided for contacts. The 94 venereal cases were mostly recommended to the clinic. Usual precautions are taken against rats; cyanide fumigation has been tried, although more anxious and expensive than sulphur-dioxide, and needing daylight. Eight ships lost 153 rats under cyanide—19 each; 53 with sulphur, lost 183—3½ each; poison baits are not used, but trapping took 48 rats on each of 79 ships—1½ each. On ships, 8092 rats were killed, 2031 ashore; none of the 661 examined was plague-infected. The rat-proofing of warehouses is not under the port sanitary authority. Over 215 tons of fruit were condemned at Hull, but all the food inspected at Goole was sound. Medical inspection of aliens covered 9593 persons, noticeably clean.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED SEPT. 22ND, 1928.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 113 (last week 92); scarlet fever, 2097; diphtheria, 1122; enteric fever, 88 (last week 122); pneumonia, 587; puerperal fever, 38; puerperal pyrexia, 102; cerebro-spinal fever, 7; acute poliomyelitis, 12; acute polio-encephalitis, 3; encephalitis lethargica, 24; continued fever, 1; dysentery, 10; ophthalmia neonatorum, 106. No case of cholera, plague, or typhus fever was notified during the week. The return for enteric fever includes 27 cases of paratyphoid fever, of which 11 were notified in London.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Sept. 25th–26th was as follows:—Small-pox, under treatment, 13; under observation, 2; scarlet fever, 1768; diphtheria, 1511; enteric fever, 75; measles, 85; whooping-cough, 251; puerperal fever, 16 (plus 10 babies); encephalitis lethargica, 71; poliomyelitis, 2; "other diseases," 19. At St. Margaret's Hospital there were 16 babies (plus 7 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 5 (1) from enteric fever, 11 (0) from measles, 4 (0) from scarlet fever, 30 (10) from whooping-cough, 29 (6) from diphtheria, 139 (32) from diarrhœa and enteritis under two years, and 25 (2) from influenza. The figures in parentheses are those for London itself.

The fatal cases of enteric fever outside London were reported from Southend-on-Sea, Wallasey, Hull, and Newcastle-on-Tyne. Of the fatal cases of measles 2 each were reported from Birmingham, Liverpool, and Carlisle, while Belfast reported 4. Southampton, Birmingham, Liverpool, Doncaster, and Newcastle-on-Tyne each reported 2 fatal cases of whooping-cough. There was a further increase in the number of deaths from diarrhœa, of which Liverpool reported 17, Birmingham 13, and Leicester 5, while the figures for Glasgow, Dublin, and Belfast were 8, 10, and 11 respectively.

The number of stillbirths registered during the week was 286 in the great towns (corresponding to a rate of 44 per 1000 births), including 46 in London.

Reviews and Notices of Books.

THE BLOOD PLASMA IN HEALTH AND DISEASE.
By J. W. PICKERING, D.Sc., Lecturer on Hæmatology, University of London, King's College. London: William Heinemann, Ltd. 1928. Pp. 247. 12s. 6d.

THIS constitutes one of the most valuable works on the subject of the blood published for a long time past. The fact that it is devoted to the consideration of the plasma alone adds to its merit. For all that many recent works on hæmatology have to say on the plasma, the blood might consist of red cells, white cells, and platelets floating, like the heavenly bodies, in a void. This volume is a healthy reminder of the existence of the plasma, its complexity, the subtle, and yet enormously important, changes which it may undergo and its weighty rôle in the life process. The changes undergone by the plasma in the course of coagulation naturally occupy a considerable portion of the book; there are few subjects in physiology about which there has been—and still remains—so great a diversity of opinion, and all opinions are noted and commented upon by the author. The complexity of the various theories of the mechanism of coagulation and the even more maddening complexity of their nomenclatures is known to every medical student, and all who have struggled with the subject will rejoice that the author is able to offer some hopes of the final emergence of a unifying generalisation—"Instead of postulating a large number of bodies reacting in unknown ways, the plasma is seen as a unit capable of easily reacting with foreign substances by its unsatisfied side chains, but returning to a normal condition when the foreign substance has been eliminated." The chapters on the arrest of hæmorrhage, the problem of thrombosis, and the blood of abnormal bleeders, as may be judged from their titles, contain matters of the greatest interest alike to the student, the practising doctor, and the laboratory worker. The last-named chapter contains what is probably the most masterly and yet concise exposition, available in any language, of the relationships of the various types of abnormal bleeding met with in clinical practice. It is interesting to note that the author, on the basis of his own work, finds himself in agreement with the century-old suggestion of Nasse—that the blood of hæmophilics represents a reversion to a primitive type. This is one of the illuminating flashes which occur again and again throughout this volume and make it worthy of careful perusal. A valuable feature is the appendix, containing brief notes of the various coagulants used in clinical practice. Here the author has wisely departed from the usual custom, in so far as he has included all the principal proprietary coagulants on the market, and has thus provided a small codex of immense value to the practitioners.

This book is a model of its kind and a striking witness to the debt owed by practical medicine to the laboratory; it cannot fail to become a standard work, and no student of medicine, qualified or unqualified, practical or academic, can afford to neglect its message.

RECENT ADVANCES IN DISEASES OF CHILDREN.
By W. J. PEARSON, D.M., F.R.C.P., and W. G. WYLLIE, M.D., M.R.C.P. London: J. and A. Churchill. 1928. Pp. 591. 15s.

THE authors point out that this is neither a typical unit of the Recent Advances series, nor a text-book in the ordinary sense of the word. Their object has been to formulate principles for solving the problems of disease, and to stimulate discussion on the philosophy of the subject. They have presented a theory of disease, applicable in particular to children, which, while it embodies some principles that are already widely accepted, perhaps carries the process of systematisation to an extreme degree. The

conclusions at which they arrive are in many cases hypothetical and likely to stimulate the controversy which they invite, but the serious attention of all who are interested in the speculative aspect of pediatrics will be arrested by these new ideas. Dr. Pearson and Dr. Wyllie assess the infective factor in disease considerably below the value usually accorded to it, while the constitutional and dietetic factors are given the predominant position. Children are held to deviate from the normal along two definite lines, resulting in the lymphatic, alkaline, hypocalcic type, and the acid, hypercalcic type. A relation is found between these types of constitutional predisposition and the majority of disorders to which children are susceptible, including diseases such as tuberculosis and rheumatism in which an infective element is recognised. In the elaboration of the characteristics of these types attention is focused almost entirely on the physico-chemical aspect; their relation to the endocrine-autonomic system receives some recognition, but the reader is often left in doubt as to the extent to which they are conditioned by the endocrine pattern of the child, or are influenced by environmental factors. Of individual diseases, perhaps rheumatism is the one to which the authors have applied their theory most thoroughly. They suggest that over-production and undue retention of acid is the principal cause, and that strongly acid sweat is an indication of this state. The actual rheumatic symptoms are attributed to excess of calcium phosphate, a condition to which the rheumatic type of child is predisposed. The view that chorea is an inflammatory condition is rejected in favour of the somewhat startling suggestion that it results from excess of phosphate in the cerebellum.

The section on disease of the chest is admirable, and brings into prominence some important clinical points which have suffered neglect in many text-books, such as the distinction between syn- and meta-pneumonic empyema. A really clear and condensed account is given of the modern conception of nephritis and its extremely difficult classification from the clinical standpoint. Throughout the book the reader is impressed by the evidence of clinical experience and careful observation. On questions of ætiology, the authors, while rightly adopting a more or less dogmatic attitude, occasionally present a somewhat one-sided view of a contentious question. For instance, they adhere strongly to the prenatal origin of cerebral diplegia, and state that the opposing view is "based entirely upon the fact that many cases of cerebral diplegia have a history of difficult or premature birth"—hardly a fair summary of the evidence adduced in favour of a natal origin. A chapter on X ray diagnosis is illustrated by some excellent reduced photographs. Each chapter closes with a small but well-chosen list of references.

This is a book for the post-graduate rather than the student. It contains a wealth of interest, and may be strongly recommended to all who are willing to exercise their critical faculties and to reconsider some of the conventional ideas and classifications of children's disease.

RADIOTHERAPY.

Handbuch der Gesamten Strahlenheilkunde: Biologie, Pathologie und Therapie. Vol. I. Second part. Edited by Dr. PAUL LAZARUS. Munich: J. F. Bergmann. Pp. 225.

THIS is the continuation of the first volume of a comprehensive work dealing with radiotherapy from several points of view. It consists of a number of essays on the biological, pathological, clinical, physical, and engineering aspects. The part under review commences with a chapter by Stephan Mayer on the calibration and measurement of the rays produced by radio-active bodies. He deals not only with the estimation of radio-active salts, but also with radio-active waters and gases. This is followed by a description of modern X ray apparatus for therapy by R. Glocker, who emphasises the importance of the hot cathode tube at tensions of about 200 KV (peak), and of the transformer unit with condensers which produces a practically constant tension. The author goes on to describe various forms of protection which are essential, and a table gives an interesting comparison between the protective qualities of various materials.

In the next chapter H. Behnken gives a brief and readable account of those methods of measuring intensity and quality of the X ray beam which are in use at the present time. It is interesting to note that for the measurement of quality the sphere spark-gap is employed in Germany as in this country, the spectrometric methods, too complicated for every-day use, being reserved for laboratory control. Intensity measurements, on the other hand, are almost entirely carried out by ionisation methods and such accessories as the Sabouraud pastille and the Kienbock strips are now almost of historical interest. The absolute dose of X rays, 1 Rontgen, though carefully defined, is still difficult to measure, except with elaborate precautions. F. Dessauer and B. Rajewsky follow with a chapter on the distribution and conversion of X ray energy in the body. The part which deals with the distribution of X and γ ray energy and the methods employed to measure is instructive. Four possible explanations of the conversion of X ray energy in the human body are examined; and Dessauer's own hypothesis of "point heat" is dealt with in detail. It is perhaps ill-advised that a subject which is still so very hypothetical and, it may be added, controversial, should be given so much space in a text-book. This particular essay is followed by a long list of references to literature. The last two chapters, which occupy more than half the book, are devoted to the histological and pathological aspects of radiotherapy. In the first of these, C. Regaud and A. Lacassagne deal with the physiological reactions in general of the cell to radiation. They then describe the particular physiological reactions of the skin, testes, ovaries, the blood, and the ductless glands to X rays. In discussing the biological effect of X rays, they favour the explanation of direct rather than indirect action, but believe that the latter also occurs. In the last chapter, O. Lubarsch and J. Wätzen discuss the action of rays in a variety of special conditions.

The work is likely to make an appeal to those medical men who, while actively engaged in radio-therapy, are anxious to explore the theoretical basis of their specialty.

THE NOSE, THROAT, AND EAR.

By JOHN F. BARNHILL, M.D., F.A.C.S., Professor of Surgery of the Head and Neck, Indiana University School of Medicine. London and New York: D. Appleton and Co. 1928. Pp. 604. 30s.

THIS is a text-book on diseases of the throat, nose, and ear written for students and practitioners. It is a large volume, and the author attempts to include regions and diseases which are not usually described in such works. Thus diseases of the mouth and tongue are discussed, but, in some instances, at a length not sufficient to be of real value: the space allotted to cancer of the tongue is wholly inadequate. A considerable section is devoted to facial neuralgia, and injection of the Gasserian ganglion is clearly described; but the eight lines devoted to acromegaly, and the six lines on stammering, are really useless. The omission of such extraneous matter would have allowed more space to be devoted to the common and important diseases of the nose, throat, and ear. The section on the ear is the best, and the chapters on the larynx the least satisfactory in the book. The illustrations are numerous and helpful, but here, again, those showing *intralaryngeal* disease are less good than the others. There is some evidence of want of care in revision; for instance, tabes is not mentioned among the causes of paralysis of the vocal cords, and the old fallacy that papillomata may become malignant is twice repeated. The accounts of common operations, such as tonsillectomy and

those on the mastoid, are excellent, and the indications given for operation on the ear are sound and well set out.

GYNÆCOLOGY WITH OBSTETRICS.

Second edition. By JOHN S. FAIRBAIRN, M.A., B.M., B.Ch., F.R.C.P. Lond., F.R.C.S. Eng., Obstetric Physician to St. Thomas's Hospital. London: Humphrey Milford, Oxford University Press. 1928. Pp. 810. 25s.

IN certain countries at the present time attempts are being made to divorce gynæcology from its sister subject obstetrics, and to combine it with certain other branches of abdominal surgery. Dr. Fairbairn, in common with other leading men in this country, feels that for a proper understanding of diseases in the non-pregnant female organs of generation an extensive knowledge of the physiology and pathology of pregnancy and parturition is necessary. In this small volume he has welded the two subjects together in a manner which only a master of the art of teaching could contrive. The student will find in it everything he is likely to require in the examination room or in general practice on diseases and conditions peculiar to women. Moreover, the ethical and medico-legal aspects of the subject are well set out. Failure to observe the regulations laid down for the notification of births and diseases associated with parturition often cause the young practitioner considerable inconvenience. The author has made the obligations of the medical attendant quite clear. Throughout the book Dr. Fairbairn relentlessly follows the late results of bad midwifery to their logical conclusion, and impresses the reader with the importance of the part his subject plays in the science of preventive medicine. As to gynæcology, it is the principles rather than the practice of operations that are here discussed, and the surgeon will have to go elsewhere for operative detail.

The first edition of this book had insufficient illustrations on the pathological side. Now 38 excellent new figures have been added. Other alterations have been found necessary as the result of recent work on the anatomy and physiology of reproduction and the increasing importance of radium therapy in the practice of gynæcology. We predict for this admirable work a long period of increasing popularity.

A TEXT-BOOK OF HISTOLOGY.

Arranged upon an Embryological Basis. By Dr. FREDERIC T. LEWIS, Associate Professor of Embryology at the Harvard Medical School; and Dr. J. L. BREMER, Associate Professor of Histology at the Harvard Medical School. (Being a third edition of the Text-book of Histology by Lewis and Stöhr.) Philadelphia: P. Blackiston's, Son and Co. Pp. 551.

THIS text-book is planned on the method of teaching in use at the Harvard Medical School. The earlier editions were founded on Prof. Stöhr's German Text-book of Histology but, since the introduction of embryology into the teaching of histology was not favoured by Prof. Stöhr, the entire responsibility for the later editions has been taken by the present authors. The method, although rational, is at a disadvantage in an elementary text-book. The descriptive accounts of histological structure are too often interrupted by the introduction of embryological matter, so that the important points of histology stand out less prominently than they should do. While the book should prove helpful to one who has some previous knowledge of the subject, being thoroughly up to date and reliable, it may prove stiff reading for the beginner. The section on the endocrine glands is particularly interesting and embodies the latest teaching on that subject. Throughout the book numerous references are made to current literature and many instructive descriptions of research methods are given. The numerous coloured drawings and diagrams are well chosen.

MEDICAL JURISPRUDENCE AND TOXICOLOGY.

Sixth edition, revised. By WILLIAM A. BREND, M.A. Camb., M.D., B.Sc. Lond., Lecturer on Forensic Medicine, Charing Cross Hospital. London: Charles Griffin and Co., Ltd. 1928. Pp. 327. 10s. 6d.

THE new edition of Dr. Brend's well-known handbook retains the useful format of its predecessors and has been made of increased value by the incorporation of matter relating to recent important legislation. The changes involved in the Coroners Act of 1926, the Mental Deficiency Act of 1927, and the Registration of Births and Deaths Act of 1926, are here given full attention. In the section dealing with toxicology no mention is made of poisoning by arsenobenzol compounds, and the effects of intoxication by dial, allonal, and other preparations of barbituric acid are dismissed rather more briefly than they merit. On the other hand, the paragraphs relating to the effects of gaseous poisons in war are perhaps redundant. These are, however, minor details in a volume which epitomises the main facts of medical jurisprudence in an admirable manner.

JOURNALS.

JOURNAL OF INDUSTRIAL HYGIENE. September.—Alice Hamilton points out how publicity given in America to the toxicity of benzol has led to great decrease in its industrial use. Benzol-rubber solution is being replaced by rubber latex, a change claimed to be as important as the substitution of sesquisulphide of phosphorus for yellow phosphorus; the new material is now used in canning, making tyres, cementing shoes, and making dipped rubber goods. Toluol is replacing benzol in cellulose coatings and lacquers, and naphtha in dry cleaning. This poisonous solvent should soon disappear.—The result is reported by W. Wright, C. O. Sappington, and E. Rantoul, of an investigation of 102 public water-supplies, supplied through lead pipes; 253 persons, chosen haphazard, drinking these waters, were medically examined. All the waters contained lead, the amount being more closely related to the carbon dioxide content than to the length of lead pipe. Sixty-three, or 25 per cent., of those examined exhibited signs of poisoning. A dose as little as 1 mg. of lead daily over eight and a half years caused poisoning. The incidence was less among children than adolescents, and greater yet among adults. Women showed a definitely *lower* incidence than men. This investigation, which is given in detail, is one of some importance.—An article on antiseptic spraying receives comment on p. 715 of our present issue.

Reports and Analytical Records.

"PURITY" TIPS TEA.

(GEORGE J. MASON, LTD., BRADFORD-STREET, BIRMINGHAM.)

THIS tea, which has been especially blended, claims to be suited to those who find difficulty in digesting ordinary tea infusions, and who, in addition, prefer a tea of a high grade. On analysis the following results were obtained:—

Moisture	6·2 per cent.
Ash	5·1 "
Caffeine	3·5 "
Tannin	12·2 "
Extract yielded to hot water	38·0 "

The percentage of caffeine to which the stimulating properties of tea are due is normal, and that of tannin distinctly below the average for a tea of this class. Hence this beverage should appeal to those who consider that this latter constituent should be as low as possible. The tea itself is undoubtedly of a high grade, and in the cup it is refined and delicate to the palate.

THE LANCET.

LONDON: SATURDAY, OCTOBER 6, 1928.

THE CONFUSION OF TONGUES.

"Behold, ... they have all one language; ... and now nothing will be restrained from them, which they have imagined to do."

DURING the war a pathologist, exasperated by the inefficiency of a qualified assistant sent out from home, protested that "he didn't even know the language." This was held to be a frivolous complaint and evoked the official rebuke that to the medical officers requisitioning reports it would be a welcome change to receive the same couched in terms familiar to them. Unfortunately for this argument they found that the reports signed by the assistant were inarticulate and unhelpful, since instead of using glibly the portmanteau words which express a complicated process in a brief phrase, he was labouring to give expression to conclusions based on observations (which he did not know how to describe) made on material he was incapable of analysing. The moral is clear; special branches of knowledge must develop a terminology because they can progress in no other way. New concepts can, it is true, be explained in simple words by such masters of exposition as Sir ARTHUR KEITH and Sir WILLIAM BRAGG, but only when they have reached a certain stage. The paraphrase of technical terms and expressive symbols is a difficult art, and it would simply be waste of time as between actual workers. In modern medicine there are many expressions pregnant with meaning among workers in a special department which convey little to those engaged in other branches of medicine or harassed by the calls of general practice. Examples taken at random are the pH of the blood, Weber's law, the reticulo-endothelial system, the Nonne-Apelt test, dysgenetic epithelial hyperplasia of the breast, a shift to the left in Arneth's count, Angstrom unit, buffer substance, platelet count, oxytocic activity—the list might be multiplied indefinitely. This Babel of tongues may be regretted by the antediluvian, but it is a factor of progress and must be accepted as such.

How, then, can we promote coöperation between the different sections of our science, or, as a practical problem, how can we enable the practitioner to interpret the aid which specialists are prepared to offer without expecting from him the impossible effort not only of learning but of keeping up with all these languages? We have seen that one apparently obvious way leads nowhere, or anyhow to an uninspired and dull light. This is only in accordance with general experience. If we want from a foreigner an authoritative opinion we know that he will be fluent and informative only in his native tongue. It is worth while to discourage his halting and cramped attempts at English (this is sometimes difficult) and to urge him to express himself in his own language. The reproach, therefore, that pathologists and biochemists especially couch their reports in a jargon meaningless to practitioners should not be made without considering the alternatives open to them. Some of the terms used are convenient symbols, the significance of which could only be explained to the uninitiated by means of long argument. The place for this is not in the individual report but, as we hope to show, in an article planned for the purpose. But it is clear that if we are to use to the full the experience gained by these children of medicine who have travelled widely in neighbouring lands, we must acquire the means of interpreting their languages. It is regrettable that some of them should not be in a position to help, having apparently quite forgotten their simpler mother tongue; while others, as Sir THOMAS HORDER pointed out in an address to the Association of British Pathologists,[1] confuse the issue by prolixity, by personal bias in favour of criteria not generally accepted, or by the use of individual instead of standard notation. We can fairly urge each set of specialists to decide on a common nomenclature, so that one can expound the views of another, even as a good system of shorthand enables one typist to transcribe the notes of another. So much having been achieved, there would still remain the problem of interpreting the general import of the message to those who have not recently been through an intensive post-graduate training in the specialty concerned—be it pathology, ophthalmology, radiology, or whatever.

Encouraged by the success of the series of articles on "Modern Technique in Treatment," we have decided to attempt this more difficult task in our columns. Starting on Sept. 1st of this year we have already dealt with the interpretation of agglutination reactions, swabs from the nose and throat, and sputum; and to this issue Dr. J. G. GREENFIELD contributes the first of two articles on the cerebro-spinal fluid. Among others to appear in the immediate future are those on the interpretation of glycosuria, the Arneth count, auditory tests, chemical analysis of the fæces and of the blood, renal function tests, to mention only a few. They are contributed by invitation addressed to specialists who are known to have a keen appreciation of clinical needs, or to those who have discovered for themselves how best to interpret various aids to diagnosis and are willing to give to others the benefit of their experience. Not all articles will seem of interest to all readers at the time of their appearance, but our intention is that they shall serve as a source of quick reference when a report arrives, and of information as to when a test should be requisitioned. The ground to be covered is very large, and no attempt will be made either to map it out on a systematic plan, or to give any more details of the methods used than will suffice to indicate their purpose. Books on technique are plentiful, but notes on interpretation are scattered widely and difficult to find. It is this gap which, with the help of our contributors and our readers, we propose to try to fill.

MEASLES.

MORE than a decade has passed since the first attempt was made to use the serum of convalescents for protecting children against measles. The fact that the method has not come into general use in this country must be attributed either to its inefficacy, to its uselessness as a practical measure, or to failure of publicity. The importance of measles as a cause of death in childhood makes it worth while to review the facts as we know them to-day.

In the course of some experiments on monkeys in 1911 it was discovered that the animal's blood had

[1] THE LANCET, July 21st, p. 136.

protective properties when they had recovered from the disease. From this it was an obvious step to the use of serum from convalescent patients, and the subsequent investigations seem to leave no doubt that such serum is of value as a prophylactic. In our present issue, for example, Dr. WILLIAM GUNN records a series of observations which show how useful it can be in giving temporary protection to those exposed to infection, and although there are exceptions the general tenour of reports from many parts of the world is equally favourable. If administered intramuscularly up to the fifth day after exposure, convalescent serum, in doses of 5 c.cm. for children under 5 years of age, will almost always prevent the disease from developing, and even if it is given after the fifth day the infection will be modified according to the dose and the period which has elapsed. That so many workers have reached these conclusions suggests, on the face of it, that serum should be freely employed. On the other hand, it is reasonable to argue that no good can come from the brief protection which the serum affords, and admittedly the child receiving this passive immunisation becomes again susceptible to the disease within a few weeks, which makes it necessary to repeat the dose at every exposure to infection. Again, it may be urged that the low mortality of measles among upper-class children shows that the cases only need good nursing, whilst there is no place for preventive methods where everyone must sooner or later be infected. And these objections seem reasonable enough in their way. But the fact remains that children are not always nursed, and cannot always be nursed, in good surroundings, and that last year the disease killed five times as many people in this country as scarlet fever. Most of these fatalities—and the totals involved are enormous—occurred in children under 3 years of age, and since everyone agrees that the longer an attack can be postponed the less likelihood there is of complications or death, they constitute a very powerful argument in favour of immunisation. Furthermore, when children are congregated in schools and hospitals they are liable to suffer much more severely from measles infection, and, as we have several times insisted, it is very undesirable that the complaint should be allowed to take its course in schools or institutions where secondary infections are often contracted. As, however, measles differs from most of the other infectious fevers in its extreme contagiousness, prompt isolation is generally useless, and the only way of checking an epidemic is some such form of prophylactic agent as is available in convalescent serum. Even should the authorities of a school fail by this means to prevent an epidemic, they may be sure that they will lessen the trouble and damage done by the disease, for the attacks will as a rule be mild and recovery speedy, the patients nevertheless gaining the usual permanent immunity to the disease.

For the reasons we have outlined, those competent to judge are generally convinced that the beneficial results of convalescent serum in the prophylaxis of measles cannot be too widely known, and they are anxious to make it clear that the serum will be of some value at whatever time in the incubation period it is given, although, of course, the sooner it is given the better. If by these measures the high mortality in young children can be prevented and the distressing complications reduced, it is exceedingly desirable that a plentiful supply of serum should be ready for those who need it. Unfortunately the task of collection is difficult in London, for, as Dr. GUNN shows, only 2 per cent. of the measles patients admitted to the Metropolitan Asylums Board hospitals are over 7 years of age, so that the blood of adults is not often forthcoming. This scarcity has encouraged a great deal of research into methods of procuring immunised serum from animals, but so far the results have not been very satisfactory. The causal organism of measles has not yet been definitely isolated, and most investigators report unfavourably on the use of the so-called anti-measles sera made from horses and goats. HOYNE and PEACOCK in Chicago give a good account of goat serum which they have tested, and other workers have also had successes; but those who study Dr. GUNN'S paper will not feel encouraged to pin their faith to any of the animal sera which he has tried, and will prefer to use convalescent serum if they can get it. We hope that an increasing demand will bring about an increasing supply of suitably tested human serum, and the time is ripe, if not over-ripe, for the launching of a big scheme for its collection at hospitals.

THE AUSTRALASIAN COLLEGE OF SURGEONS.

WE have just received the first number of a periodical which will have a warm welcome in this country, for it is the *Journal* of the College of Surgeons of Australasia. Those who have heard something of the difficulties which have beset the College since its birth will be especially glad of this sign that it is making an auspicious start in its "endeavour to promote the science and art of surgery." This is the description of its aims given by the President, Sir GEORGE SYME, and he has elaborated them by saying that they will be carried out "by arranging for special post-graduate training in surgery, and by establishing standards of surgical competence and surgical ethics." Hitherto there has been little or no post-graduate surgical training available in the Commonwealth or in New Zealand, and the College will be doing excellent work if it can remedy this very serious deficiency. It should be understood, however, that it is not a teaching institution, nor does it confer a registrable diploma, and on this departure from the British precedents a good deal of criticism has been based. A principal hope of the Founders is that the new institution will be able to check some of the commercialism which is apt to creep into professional life, and they are deeply concerned to discourage the practice of surgery by persons who have no special ability, training, or experience. This end will be partly achieved, they believe, if persons of approved skill and integrity received a hall-mark which the public can recognise, and they trust that the association of members of the surgical craft in one body, bridging the gulf between State and State, will result in a more perfect service to the community. The conferment of the Fellowship by election rather than competition has unfortunately led to misunderstanding, and there is a feeling among general practitioners that a large proportion of surgical work ought to remain in their own hands, since it is unwise to expect sound emergency work from those who send all their ordinary cases to a specialist. We trust, however, that these problems will solve themselves in course of time, so that the admirable aims of the Founders may be harmoniously attained. The new journal, if it maintains its present standard, will go far towards realising one of them.

THE MEDICO-LEGAL SIGNIFICANCE OF BLOOD GROUPS.

THE blood groups of the human race have received a great deal of attention during the last ten years, and certain facts concerning them are now established. Thus it is universally admitted that the red cells contain the agglutinable factors A and B, though this does not exclude the possibility that there are other "agglutinogens" as well. It is also agreed that A and B may be present in the red cells either singly or together, or that they may be absent altogether, and that on the basis of these four possible combinations all bloods may be divided into the four groups now usually referred to as AB, A, B, and O, and corresponding to Groups I., II., III., and IV. (Moss), or IV., II., III., and I. (Janssky). The presence or absence of A and B in any given blood may be demonstrated by the use of sera known to contain the homologous agglutinins and usually described as α and β. Further, there is evidence, apparently conclusive, that, when once established, the group constitution of a given blood never changes; and, lastly, there are strong reasons, both theoretical and empirical, for believing that A and B are Mendelian dominants and are transmitted to offspring according to well-established laws. From this it would follow that A and B cannot appear in the offspring unless present in the parents, and the recent work of F. BERNSTEIN [1] makes it almost certain that O also is a dominant. If this can be proved it means not only that matings involving a parent of the group constitution AB can never give rise to offspring of the constitution O, but also that matings involving both AB and O can never result in offspring of either of these groups.

Even in the present state of our knowledge it is evident that the subject will become of great importance in forensic medicine. Some years ago SCHÜTZE demonstrated that it is possible to determine the groups of blood which has existed in a dried state on fabric for many months, and the establishment or disproof of the identity of group of blood stains on the clothes of the suspect and the blood of the victim may serve to complete or demolish a chain of otherwise circumstantial evidence. It is, however, in civil cases involving questions of paternity that the blood groups may be expected to play their most important part. It is true that by reference to the groups we shall never be able to identify the father of a given child, but in a very fair proportion of cases it may be possible with absolute certainty to state that the alleged or putative father of a given child is not the father in fact. The importance of this means of establishing non-paternity is obvious and has its applications in suits for maintenance of children born out of wedlock and in cases of alleged adultery. That blood tests have not as yet been much invoked in civil processes in this country may be taken either as a tribute to the excellent state of the public morals or to what is usually described as the "innate conservatism" of the British courts. In England, moreover, the custom has rightly been to use scientific methods—e.g., comparison of finger-prints—as a means of detection rather than the basis for a verdict. But in Germany the use of blood groups in forensic medicine has engaged the lively attention of jurists and medical men. The attitude to be adopted by the German Bar was discussed not long ago in the Berlin Legal Society, and the sense of the meeting was summed up by Judge LEONHARD, President of the Prussian Court of Appeal, to the effect that until as a result of scientific research the knowledge and understanding of the blood groups and their mode of inheritance has been placed beyond all doubt, evidence based upon them cannot be regarded as demonstrating the "manifest impossibility" (offenbare Unmöglichkeit) of paternity. Until this has been done, he said, such evidence cannot overrule the aphorism "Vater ist, wer der Mutter während der Empfängniszeit beigewohnt hat." Though both the Prussian and Austrian courts are willing to admit as evidence facts bearing upon the blood groups of the parties involved, it has been laid down in Prussia that "the impossibility of fatherhood cannot be legally regarded as being established absolutely (einwandfrei) by a blood examination." In Austria the ruling has been made by the Supreme Medical Council that "in the majority of cases the results of blood examinations will not assist in the establishment of paternity"; but nothing is said about the value to be attached to the evidence afforded by the blood groups in that minority of cases in which the tests point clearly to non-paternity. Thus the tendency of the lawyers, by no means unnatural, is evidently to thrust the onus of incontrovertible proof upon the biologists, and their challenge is taken up by 16 professors and heads of departments who contribute to a symposium in the *Deutsche Medizinische Wochenschrift*.[2] All 16 agree absolutely that the general facts concerning the constitution and inheritance of the groups are fully established, and several report cases in which blood tests have been admitted by the courts and have played an important part in the solution of legal problems. Thus Prof. ZIEMKE, of Kiel, mentions a case in which a woman accused a man of the paternity of her child; unfortunately for herself she happened to select as her child's father a man whose blood formula rendered his paternity impossible; she was found guilty of perjury and sentenced to six months' imprisonment.[3] Prof. TOBBEN, of Münster, quoted two cases in which alleged fathers were found to have blood groups inconsistent with paternity of their supposed children and were consequently relieved of the charge of maintenance.

Several contributors comment upon the need for extreme care in making the tests, and insist that examination should always be by microscope and that the test serum shall be allowed to stand for several hours, or even overnight, in contact with the red cells to be tested. No mention is made of adsorption tests, though in certain cases the agglutinogen titre of red cells may be so low as only to be demonstrable by removal of the homologous agglutinin from serum of the opposite group or of Group O by the use of large masses of cells. The question of providing and maintaining stocks of known sera of Groups A and B is not discussed. This is bound to assume great importance in the near future, and it seems desirable that there should be in this country a roster of persons proved to be of Groups A and B and available as sources of grouping sera. Such persons are known to the heads and directors of many laboratories throughout the country, and their bloods ought to be tested in every way possible, both in this country and abroad, in order that international standards may be established and maintained. The Health Commission of the League of Nations has just expressed its opinion that the standard sera in use in various countries should be compared by the Danish State Serum Institute, acting as the central laboratory of the League's Health Organisation, with a view to the adoption of such standards. It has further recommended that comparative experiments should be made in regard to the preparation, conservation, and titration of test sera, and also of the methods of determining the groups, and has expressed its satisfaction that the terminology outlined above, by which the groups are called A, B, AB, and O, has met with general approval.

[1] See THE LANCET, 1928, i., 1182.

[2] Deut. Med. Woch., July 27th, p. 1240, and August 3rd, p. 1285.

[3] See THE LANCET, 1927, ii., 1257.

Summer Time, which began on April 22nd, will cease on Sunday next, Oct. 7th, at 3 A.M., when the clock will be put back to 2 A.M. The hour 2–3 A.M. Summer Time will thus be followed by the hour 2–3 A.M. Greenwich time.

Annotations.

"Ne quid nimis."

THE DENTAL BOARD IN IRELAND.

THE official position of dental practice in the Irish Free State is now being cleared up. With the passing of the Order in Council on July 14th, 1922, Southern Ireland ceased to exist as far as the Dental Board of the United Kingdom was concerned, although happily this did not affect the right and duty of representatives from the Free State to sit upon the Board. The Medical and Dentists Acts Amendment Act passed last year validated the action of the Dental Board during the interregnum. Our Dublin Correspondent informs us that steps are now in progress for the formation of a separate Dental Board, as provided for by the Dentists Act of the Irish Free State. The Medical Registration Council has nominated three members as required by the Act. Although no restriction is laid by law on the Council in its choice of nominees, it has, as was expected, nominated three of its own body—namely, President D. J. Coffey, Prof. A. F. Dixon, and Mr. R. C. B. Maunsell. The overlapping of the Medical Registration Council and the Dental Board as regards membership ought to render easier the coöperation which is so desirable. Having received the nominations made by the Medical Council the Executive Council of the Irish Free State proceeded to make its nomination. Its choice fell on Dr. D. L. Kelly, one of the medical inspectors of the Department of Local Government and Public Health. It now falls to this body of nominated members to carry out the election of the elected members and thereby complete the Board. Two members are to be elected by registered dentists resident in the Irish Free State who are registered or were formerly registered in the General Dentists Register under Section 3 of the Dentists Act, 1921. Four members are to be elected by the registered dentists resident in the Irish Free State who are registered or were formerly registered in the General Dentists Register otherwise than under Section 3 of the Dentists Act, 1921. The compiling of a list of electors for the two elections will be a difficult matter, as many dentists have allowed their names to disappear from the General Dentists Register during recent years when there have been no laws governing dental registration in the Irish Free State.

HEAT REGULATION AND THE THYROID-ADRENAL APPARATUS.

THE progress of physiology makes it more and more clear that the finer mechanisms of bodily functions are under the control of the glands of internal secretion. Vitalistic theories and a priori assumptions must give way to experimentally verified explanations of a chemico-physical nature. It is true that such explanations can only be proximate, the ultimate nature of life-phenomena being hidden, but it is only by attempts to furnish them that an insight into the pathology of disease can be obtained. At the same time it must constantly be kept in mind that the body is not a multipartite system with physiologically separated influences in play, but a coördinated unit which is the resultant of many components, each of which, mathematically expressed, is a function of the remainder. Dr. W. Cramer in a recent publication [1] points out that in regard to the body's regulation of its heat production and heat loss such sterile conceptions as "heat centre" must give way to rational conclusions based on experiment. The components entering into the regulation of heat are the sympathetic nervous system and the thyroid and adrenal glands; the conditions of fever are fixed by the actions and interactions of these glands and their effects on the sympathetic system. By carefully worked-out histochemical methods the functional activity of the adrenal has been studied by Dr. Cramer, special attention being paid to the condition of the medullary adrenalin "granules" and the cortical lipoid. One important result of this study has been to show that a functional unity exists between the medulla and the cortex, the active secretion of adrenalin being accompanied by definite changes in the cortical lipoid. Dr. Cramer further shows that agents which stimulate or inhibit the secretory activity of the adrenal produce similar effects in the thyroid. The whole mechanism of heat control is under the influence of the sympathetic, both the physical factors, such as sweat glands, calibre of peripheral vessels, arrectores pilorum, and so forth, and the chemical factor arising in the carbohydrate liberated from the liver. He demonstrates that all these factors are profoundly affected by the thyroid-adrenal apparatus, and in fact reaches the conclusion that "the thyroid and adrenal glands represent an endocrine apparatus for the heat regulation of the body." That no mention is made of the pituitary must be intentional, but most observers hold that this gland exerts a definite influence on carbohydrate metabolism and hence on heat regulation. A particularly interesting and stimulating section of Dr. Cramer's work is that dealing with the glycogenic function of the liver. The so-called storage theory is strongly attacked, the main point at issue being whether glycogen is a passive store of carbohydrate or whether it is, as Claude Bernard long ago declared it to be, of the nature of an internal secretion. The latter view has been advocated, among others, by E. P. Cathcart and J. Markowitz; Dr. Cramer has reviewed the evidence supporting it and has presented it with force. The distinction is essentially between a static and dynamic theory of glycogenic function. One striking outcome of this concept is that diabetes and other conditions associated with high and delayed blood sugar curves, hitherto regarded as due to diminished glycogenic function, become examples of an increased glycogenic function. Further, the thyroid and adrenal secretions must be regarded as increasing and insulin as inhibiting liver activity. Dr. Cramer is to be congratulated on producing a work which will be a constant stimulus to further research.

[1] Fever, Heat Regulation, Climate and the Thyroid-Adrenal Apparatus. By W. Cramer, D.Sc., Imperial Cancer Research Fund. London: Longmans, Green and Co., Ltd. Pp. 153. 15s.

THE QUEEN ALEXANDRA SANATORIUM FUND.

ONE of the minor tragedies of the war was the closing down of the sanatorium in Davos which realised the dream of the late Lord Balfour of Burleigh to collect under one roof all the British patients visiting that upland valley for their health. Ever since John Addington Symonds, acting in defiance of his London consultant, demonstrated the possibility of wintering in the Alps, the valley of Davos had been visited by an increasing number of British patients for reasons of health or recreation or judicious combination of both, and one may conjecture what might have been the gain to literature if such distinguished poitrinaires as R. L. Stevenson and Mrs. Oliphant had been able to enjoy the care and supervision of a British sanatorium. Its erection was the crowning act in the life of that great clinician, Dr. W. R. Huggard, who directed almost where every stone should be laid, and the sanatorium when complete superseded the English Home where a certain number of assisted patients lived together. After a few highly successful years the Queen Alexandra Sanatorium shut its doors in the autumn of 1914, when the journey across France became impracticable, and the alteration of money values made it impossible to reopen when peaceful conditions returned. The tragedy, however, is relieved by the fact that the good work of the foundation has not been entirely suspended, for the money realised from the sale of the building has inaugurated a fund, held by the Official Trustees, which still helps tuberculous patients of small means to obtain treatment in Switzerland. During the year

ended April 30th last, on which a report has just been issued, 44 patients of a "type and quality" commended in the report, were assisted, all of whom would have been unable to enjoy the benefit of Alpine treatment without this help. The report, however, laments the large proportion in this last year of short-time patients. The possible number of days that a patient can be under Alpine treatment in accordance with the scheme is 198, but this figure was only reached by seven patients, and there were only 18 who spent over 180 days in Davos. Patients who come out late and go away early do not get the benefit of the full winter's treatment which it is the object of the Fund to give, and the promoters take the opportunity of bringing this fact once more before the notice of the practitioners in this country on whom the onus rests. For the information of those who may still wish to make recommendations this year it may be added that grants are made at the rate of £2 (50 Swiss francs) a week to selected cases, the grant being given for a period covering the late autumn, winter, and early spring, and being conditional on the recipient staying at an approved sanatorium or pension at Davos. Applications should include a statement of financial means, a report from the family doctor, and a certificate of medical suitability from one of the honorary examining physicians to the Fund. Successful candidates are required to go out to Switzerland without delay and to stay there for the whole of the winter unless prevented by some urgent and unforeseen cause. If the patient does not elect to stay at a sanatorium where there is a resident medical man, he must place himself under one of the Fund's visiting physicians at Davos. The question, how much does it cost for a patient to live at Davos through the winter, is answered in the report by the statement that a British patient of the class for whom the Fund is intended will probably require not less than £5 a week—that is to say, £3 a week in addition to the grant of £2—which would cover everything except the journeys to and fro, and guarantee the degree of comfort desirable to give the venture its fair chance of success. Once again it should be remarked that grants are only made to persons in an early stage of the disease. The hon. secretary of the Fund, to whom applications should be addressed, is Mr. David Vesey, 97, Warwick-road, London, S.W. 5.

EPIDIDYMITIS.

EPIDIDYMITIS attributable neither to the gonococcus nor to the tubercle bacillus is not infrequent, and its diagnosis and treatment occasion considerable difficulties to the practitioner. The organisms usually responsible are staphylococci, streptococci, and the colon bacilli. More rarely the *B. mucosus capsulatus* of Friedländer and the *Micrococcus catarrhalis* have been found. Clinically the epididymitis may resemble the gonorrhœal and tuberculous varieties in that it may be either acute or chronic in its commencement. The fact that there is no urethral discharge makes the differential diagnosis from tuberculous epididymitis difficult, and it is not surprising that in many cases mistakes occur. Dr. Meredith F. Campbell[1] quotes with approval the conclusions arrived at by A. R. Stevens—that if the epididymitis is of less than one month's duration bilateral involvement favours tuberculosis; if it is associated with a sinus of over one month's duration the infection is probably tuberculous. This probability is increased if there exists clinical tubercle elsewhere in the body or marked lesions of the prostate and seminal vesicles. As an aid to diagnosis Dr. Campbell recommends the use of small doses of tuberculin which will cause a reaction only in a tuberculous case. Treatment consists of rest and careful immobilisation of the scrotal contents by means of the special suspensory bandage in use at the Bellevue Hospital. About one in four cases requires operation, which may be either epididymotomy or epididymectomy. The method of epididymotomy used by Dr. Campbell is that advocated by F. R. Hagner—namely, exposure of the testicle and multiple puncture of the epididymis with the blunt end of a Hagedorn needle. That early and thorough surgical elimination is indicated is proved by the fact that of the 79 cases of non-tuberculous non-gonococcal epididymitis collected by Dr. Campbell a third eventually lost the testicle by suppuration. To the same number of the journal Dr. Ernest Rupel contributes an article on the use of calcium chloride in the treatment of epididymitis. It is based on clinical observations made while treating cases of non-tuberculous epididymitis (both gonococcal and due to pyogenic organisms), 50 being treated by ordinary methods and 28 by these methods supplemented by intravenous injections of calcium chloride. The calcium chloride was given in doses of 0·5 g. to 1 g. in dilute solution. In most of the cases receiving intravenous injections prompt relief from pain was noted. Sometimes the relief was only temporary, but when pain recurred it generally yielded to a second injection. In 8 of the 22 patients treated one injection was sufficient. In the remaining 14 an average of 3·5 injections was required. Without being able to explain the reasons for the clinical results obtained the author expresses conviction that the injections not only relieved the patient's symptoms, but actually cut short the duration of his attack. The fact that the calcium injected was eliminated rapidly from the blood stream makes it quite likely that the determining agent will be found to be the calcium within the tissues or perhaps some new body produced through a tissue change. As no harmful effects have been noted from this form of treatment it is certainly worthy of wider trial.

[1] Amer. Jour. Med. Sci., September, 1928.

THE THERAPEUTICS OF INTESTINAL AMŒBIASIS.

IN therapeutics a periodic stocktaking may be a chastening experience. After probing the literature on the therapeutics of amœbic dysentery published during the last 30 years R. Knowles[1] and three colleagues have constructed a graph to illustrate the rise and fall in popularity of various specifics during the first quarter of the twentieth century. The early years witnessed the era of ipecacuanha which was followed by a minor, but ill-directed, wave of enthusiasm for ipecac sine emetine; hard on its heels (1912) came the work of Leonard Rogers and the introduction of emetine, which still remains in popular favour. In succeeding years emetine-bismuth-iodide, yatren, and stovarsol have to some extent replaced the older remedies. To determine the claims to serious consideration of the various methods the workers proceed to analyse the results of treatment of 154 patients. These patients, who were under the care of different professors and research workers at the Calcutta School of Tropical Medicine, received in all 220 treatments, and the results afford a basis of comparison with those obtained in other institutes. The decision as to when a real and permanent cure of such a chronic, latent, and insidious disease has been obtained is not easy to make. To follow up native patients is very difficult and even from Europeans it is almost impossible to obtain specimens of fæces for microscopical examination week by week, after the cessation of treatment. Occasionally a careful patient, interested in his own case, can be induced to send a specimen once a week for eight weeks, but such patients are rare. Moreover, even a negative parasitological test is not an absolute indication of a permanent cure. In our view the only real test is to follow up the clinical history of the patient for at least a year after treatment has been discontinued.

Of the various specifics the authors discuss first alcresta ipecac (Lilly and Co.). Of the seven patients treated with this drug three were possibly successful and four were failures—an unsatisfactory result. Thirty-two patients were treated by injections of

[1] Indian Medical Gazette, August, 1928.

emetine only; of these the ratio of probable cures to failures is 6 : 10, which is even less satisfactory than the results with alcresta ipecac. Fifty-five patients were treated by injections of emetine plus the administration of large doses of bismuth orally (Deek's treatment). Of these only 30 could be followed up. The ratio of probable cures to failures worked out at 9 : 16, a figure slightly worse than for emetine alone. Twenty-three received the emetine-bismuth-iodide treatment, and the ratio of probable cures to failures worked out at 1 : 3·5, a very low figure, although it is remarked that certain individual patients tolerate the treatment better than others and there are some remarkably good results. Of the more recently introduced yatren treatment the authors speak less favourably than do certain other observers. With the oral treatment they treated 23 cases and again some striking clinical successes were obtained, probably caused by irritation of the colon and subsequent eradication of the infection. The ratio of probable cures to failures is 1 : 1·3, a figure similar to that obtained with alcresta ipecac. Only six patients have been treated by the combined yatren therapy (oral and rectal); the ratio of probable cures to failures is 1 : 1·5. This treatment was reserved for very intractable cases, the high cost of the treatment militating against its more universal employment in India. The action of stovarsol, much lauded by French writers, was investigated in 32 patients, and the ratio of probable cures to failures of 1 : 1·1 obtained, a relatively high figure which has confirmed the position of stovarsol in the treatment of chronic amœbiasis. If given in larger doses than 0·25 g. t.d.s. the drug may exert a toxic action. Probably stovarsol is best employed in the after-treatment of amœbic dysentery. Sixteen cases were treated orally with kurchi (*Holarrhena antidysenterica*) in tablet form. The ratio of probable cures to failures was 1 : 1·1, a surprisingly high figure for so simple a remedy.

The possibility of combined treatments merits attention. Emetine with kurchi gave poor results, emetine with stovarsol was more encouraging, while the combination of emetine and yatren or E.B.I. and yatren still await extensive trial. These findings, together with the study of the previous literature, have led these workers to conclude that all these drugs are amœbicides, but weak ones.

AN OUTBREAK OF POLIOMYELITIS.

IN his annual report for 1927 Dr. W. Allen Daley, medical officer of health for Hull, gives an account of the epidemic of poliomyelitis which occurred in that city from July to September. In the years up to and including 1926 the average annual number of notifications of this disease was only 1·5, but this obviously did not give a complete account, as 104 cases of infantile paralysis in children under the age of 16 were known to the department, and in 24 of these the children were under 5 years of age. They, however, were sporadic cases. In March, 1927, there was one notification; there was a second on August 2nd; and a third and fourth on the 15th and 16th; and it gradually became evident that an epidemic was prevailing. A circular on August 29th to the medical practitioners produced further notifications, and the lag between onset and notification became gradually less. It was found that ten patients had developed the disease in the month of July. By the end of the year 111 cases had been notified, in two of which the condition was called polio-encephalitis. The age-incidence of 110 cases was as follows:—

Under 1 year of age	11 (one fatal)
1 to 2 years of age	18
2 ,, 5 ,, ,, ...	46
5 ,, 10 ,, ,, ...	19
10 ,, 15 ,, ,, ...	7 (one fatal)
15 ,, 20 ,, ,, ...	5 (two ,,)
20 ,, 30 ,, ,, ...	2 (one ,,)
Over 30 ,, ,, ...	2 (,, ,,)

In all only six of the patients died, one of them being a child of 9 months and the others over 10 years of age. There was, however, in July an unusual mortality—certificated as tuberculous meningitis—and it is thought that some of the deaths attributed to this cause were really due to polio-encephalitis. The disease attacked indifferently all social classes. As regards case-to-case infection, there was one instance of two brothers being attacked; another instance of a father and son; and a third instance in which three children from neighbouring houses played together and were infected. There was a further case of a Hull child at a seaside resort, one of whose playfellows from Liverpool subsequently died from poliomyelitis. It was not easy to say whether there were many abortive cases. Only eight of the 111 notified had no paralysis.

The city hospital admitted 55 of the patients, and other hospitals five. By way of treatment hexamine was at first given as a routine, but its use was abandoned later owing to the risk it involved to the kidneys and because no benefit was observed from its administration. Lumbar puncture was used both for treatment and diagnosis and in four cases serum from a convalescent patient, aged 27, was thought to have improved the condition of those who received it. All the patients had the advantage of after-treatment through a clinic conducted by the orthopædic surgeon, Mr. R. B. Blair. Forty-nine of the patients were given artificial light and, it was thought, were the better for it. Of those who survived the illness, 8 had no paralysis, 18 have since recovered, 28 have much improved, and 8 are stationary. In 43 some permanent paralysis will probably remain.

A "REST PAUSE" FOR THE TIRED WOMAN.

THE tired professional woman—and in this class we include the zealous house-wife—usually has two good reasons for refusing to take the rest prescribed for her. The first is that she cannot leave her work, and the second that she has nowhere to go to. The first excuse may be merely a rationalisation, but in any case if her condition of true neurasthenia is neglected it soon ceases to carry weight, because she becomes patently useless even as a cog in an organised machine, certainly as its motive power. There remains the difficult task of finding her a temporary haven where her irritable nerves can be soothed and her confidence in her ability to cope with life restored. Most nursing homes are unsuited for this treatment, partly because they are equipped and staffed to deal with acute emergencies rather than chronic conditions, and the overhead expenses are therefore too great to admit of low fees. Moreover, unless they cater for definitely mental patients they are rarely so planned that patients can live and have their meals in bed, in the garden, or in their rooms at choice, according to the whim of the moment. The salient feature of the rest home recently opened at Backsettown, Henfield, Sussex, is the recognition of the need for solitude, quiet, and complete freedom from responsibility if the patient is to recover poise and mental vigour with the least possible delay, and to maintain a healed mental attitude when she returns to normal life. The aim of the promoters of this scheme is to supply a "rest pause," under special conditions, to the efficient whose activities are threatened or impaired by the stress of modern life. Backsettown is not a convalescent home in the accepted sense of the word. It is primarily intended for the use of (1) overworked professional women; (2) women with arduous social and public obligations; and (3) mothers of families and others with heavy domestic responsibilities. Infectious, borderline, and mental cases are ineligible. The treatment offered consists of rest in congenial surroundings, also good cooking, a diet rich in vitamins, and ultra-violet radiation where needed. There is a resident fully trained matron, and the establishment is under the supervision of Dr. Octavia Wilberforce and Dr. Marjorie Hubert. The house can accommodate eight patients; the management is vested in the hands of a small executive committee, and any profits that accrue will be used for

purposes of extension. The fees charged are from £4 4s. to £8 8s. weekly according to the size of the room, and a week-end's rest when a room is available need cost only £1 5s. These charges do not include doctors' fees, which are a matter of independent arrangement. We have taken an opportunity of inspecting this home. Although within six minutes of post and telegraph, Backsettown is completely sheltered from sight or sound of traffic. The older part of the house dates from the fourteenth century, the newer part having been added in 1774. The oak beamed rooms, the lovely garden, protected by trees from north-easterly winds, and the cleverly-planned bed-sitting rooms with hot and cold water laid on, give an impression of comfort and reassurance. The rooms are light and sunny, and the furniture and hangings delightful. Electric light and central heating have been installed without spoiling the old world character of the place. The hon. secretary of the home is Miss Evelyn Fellows, 15, Eaton-gardens, Hove, to whom applications for admission should be made, accompanied, when possible, by a letter from the patient's medical adviser.

DISINFECTION BY ANTISEPTIC SPRAYS.

THE sight of someone spraying an antiseptic solution into the air in order to prevent the spread of infection must often have raised a tolerant smile on the faces of enlightened members of our profession. The process has generally been regarded as no more than an innocuous placebo. But evidence is now forthcoming from the National Institute for Medical Research [1] which will certainly shake this complacency. The investigators began by heavily charging the air with *Bacillus coli communis*, an emulsion of which was sprayed into the blast of a powerful electric fan. Later some culture plates were exposed for two minutes and incubated overnight, after which the colonies were counted. It was found that the number of colonies was greatly reduced if, before the plates were exposed, an operator, using a cheap but effective spray, had walked round the room slowly spraying an antiseptic at the rate of about one stroke of the piston per second. Two antiseptics were used and both were effective; but one of them, composed of electrolysed sea-water with about 1 per cent. of available chlorine, was of quite remarkable potency when freshly prepared. The authors of this investigation conclude that the use of an antiseptic spray in crowded workrooms, offices, and theatres is justified, though it is true that the amount used in their experiments was relatively large and might be objectionable in industrial life. When we remember how much time and efficiency are lost as a result of infectious catarrhs, it becomes evident that a small expenditure on this means of prevention might repay employers of labour.

THE TRAINING OF CIVIL DOCTORS FOR WAR SERVICE.

WHEN the United States declared war on Germany and decided to raise an army it was obvious that a medical organisation must be at once prepared to examine recruits, treat the sick, and tackle the problems of hygiene. Medical organisation camps were forthwith set up for training the civil practitioners on whom these duties would fall. The chief of them was Camp Greenleaf, near Chickamauga, Georgia, which continued to grow until the end of the war, when it held between 20,000 and 30,000 men—officers and other ranks of the Medical Corps. The medical practitioners had to be examined and graded, and were thereupon trained in all sorts of useful subjects, including administration, anatomy, French, practical surgery, psychology, and radiology. The main difficulty at first was to select and train instructors; the next was to find lecture rooms. "Other ranks" were trained to realise that theirs was the most vital work being done in the army, and were thus encouraged to make their best efforts. The results of this education were good, and for officers the process was continued in France, where they received lectures and pamphlets by various medical authorities. Many of these are reproduced in Volume VII. of the official history,[1] which has just been issued. They include Colonel B. K. Ashford's description of conditions in the front trenches, Captain H. L. Sanford on prophylaxis for venereal disease, Major G. W. Crile on shock, Brig.-General W. S. Thayer on military work for physicians, and General Cuthbert Wallace and Dr. Lemaître on war surgery. Another means of instruction was to send round parties to learn what they could from the Allies in the trenches, and in hospitals, laundries, and the like. A careful study of the work this book describes and of the programmes it contains for courses would undoubtedly be of assistance in the quick development of an expert military medical service on another occasion. There are a few defects in editing; thus, "Harrock" (p. 669) and "Horrick" (p. 712) should have been "Horrocks," and the Soyer stove (p. 704) is of French, not German, origin, but the book is a great record of the foresight and energy of the medical profession in the United States during the late war.

WE regret to announce the death of Dr. Diarmid Noel Paton, F.R.S., at the age of 70, shortly after his retirement from the Regius Chair of Physiology in the University of Glasgow.

WE announce elsewhere that the Semon Lecture of the University of London is to be given this autumn by Dr. Markusz Hajek, professor of oto-rhino-laryngology in the University of Vienna. The subject will be Laryngo-Rhinology and General Medicine, and the lecture will be delivered in the Barnes Hall of the Royal Society of Medicine at 5 P.M. on Thursday, Nov. 1st.

TWO important donations have been announced during the week. At the Middlesex Hospital Dinner on Tuesday Prince Arthur of Connaught referred to a gift of £125,000 by Lord Woolavington for the establishment of a block for paying patients, and on Monday, the retiring vice-chancellor of the University of Cambridge said that an offer of £700,000 had been received from the International Education Board of the Rockefeller Foundation, chiefly for the development of facilities for physical and biological studies. This offer is conditional upon the sum of £229,000 being raised by the university.

THE Royal Society of Medicine opened its new session on Oct. 1st under the presidency of Lord Dawson of Penn. The annual dinner is to be held on Thursday, Nov. 15th, at 7.30 for 8 P.M., at the Mayfair Hotel, Berkeley-street, W., and this year the principal guests will be Mr. Winston Churchill and Mr. Rudyard Kipling, both of whom have promised to speak. A fortnight later, on the evening of Nov. 29th, Sir William Bragg will deliver the Lloyd Roberts Lecture at the Society's house in Wimpole-street, taking Faraday's Diary, which is as yet unpublished, as his subject. The lecture will be preceded by a reception, when some of Faraday's original apparatus and also pages from his diary will be on view. Tickets of admission will be required and application for these should be made to the Secretary.

[1] The Effect of Antiseptic Sprays on the Bacterial Content of Air. By S. R. Douglas, L. Hill, and Wilson Smith. Jour. Indust. Hyg., September, 1928, pp. 219–26.

[1] The Medical Department of the United States Army in the World War. Vol. vii., Training. Washington: Government Printing Office. 1927. Pp. 1211. $3.25.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

VI.—THE INTERPRETATION OF REPORTS ON THE CEREBRO-SPINAL FLUID.

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I.*—THE PRACTITIONER'S RESULTS.

THE examination of the cerebro-spinal fluid is now generally recognised as being of the greatest importance in the diagnosis of cases of organic disease of the nervous system. Sometimes this examination by itself enables an exact diagnosis to be made; more often it serves to indicate which of two or more possible causes is the basis of the symptoms exhibited.

The Collection of the Specimen.

The examination should, for the patient's sake, only be made once, except in cases which may benefit by the repeated withdrawal of cerebro-spinal fluid. It should therefore be as complete as possible, and to this end the clinician as well as the pathologist must contribute. Complete asepsis is the first essential, and this applies as much to the collection of fluid as to the operation of lumbar puncture. A contaminated fluid soon changes in character and becomes worthless for diagnosis. Cells and sugar disappear, protein alters, and the fluid gives a fallacious Wassermann reaction. The tube in which it is received must therefore be as sterile as the lumbar puncture needle. Chemical cleanliness is almost as essential. Even the "fur" deposited by boiling instruments and tubes in hard water may upset some of the tests. Whenever possible distilled water should be used, but water which has been boiled will serve. Attention should also be given to the tube used for the collection. It must be strong enough to withstand the risk of breakage in transit to the laboratory, and should be well stoppered, preferably with rubber or glass. Corks are at best dirty and are apt to form a collecting ground for cells and coagulum.

The amount of fluid to be taken depends partly on the case, and partly on the pathologist. In my experience it is not possible to make a satisfactory examination with less than 5 c.cm. and it is unnecessary to have more than 10 c.cm. even when the quantitative chemical examination is to include glucose, chlorides, urea, and protein. In cases of meningitis or uræmia in which drainage of fluid is beneficial a larger amount will be a convenience to the pathologist. Therefore if the tubes are marked with a diamond at the levels of 5 and 10 c.cm. it is easy to steer a course between incomplete examination and excessive drainage of fluid.

The Determination of Pressure.

The manometric pressure of the fluid is of such importance that its estimation has become a routine procedure to many neurologists. It is true that an attempt to read the pressure rather complicates the operation of lumbar puncture, but the information it gives is often of the greatest value and can be obtained in no other way. This is especially true in cases of cerebral and spinal tumour where the diagnosis may sometimes be made from the pressure readings alone or from phenomena which are observed in the course of the examination, such as pain at the site of the tumour on jugular compression. It cannot be too strongly emphasised that the rate at which drops of fluid escape on lumbar puncture gives at best a fallacious and at times an altogether erroneous estimate of the fluid pressure. A simple manometric lumbar puncture needle which can easily be used single handed was described in THE LANCET two years ago (1926, i., 1208). It is generally agreed that in this as in many other clinical examinations, the routine use of the method in normal cases renders abnormal readings more obvious and more convincing by making the limits of the normal more precise; the manometer should not therefore be reserved for the rare cases of cerebral or spinal tumour, but should be used in all cases where lumbar puncture is performed.

In taking a manometric reading it is essential that the patient should be lying on his side with the head at the level of the lumbar spine; he should be breathing easily with his muscles relaxed. Often at first the pressure rises slightly above the normal, but with the patient lying quietly and comfortably it falls in a minute or so to a steady level which is taken as the "initial pressure." Meanwhile the operator notes the dancing of the fluid with the arterial pulse and the slower but rather wider movements which occur with respirations. Normal pressures vary between 100 and 200 mm. of fluid. Pressures above 200 mm., if they cannot be attributed to embarrassment of respiration as in stout or nervous patients, indicate *increased intracranial pressure.* This may be due to cerebral tumour, œdema, or hæmorrhage, or to excess of fluid, as in meningitis or hydrocephalus. It is sometimes possible to distinguish cases of hydrocephalus from those of cerebral tumour or œdema by the observation that in the latter the pressure falls much more rapidly with the withdrawal of fluid. Thus after 3 or 5 c.cm. of fluid have been removed the pressure may have dropped to two-thirds or half of the initial pressure. In hydrocephalus, on the other hand, so small an amount of drainage produces little reduction of the fluid pressure. It is my rule never to reduce the pressure below two-thirds of the initial pressure, and although quite arbitrary this rule has so far stood the test of experience. The use of a manometer is therefore to some extent a safeguard, especially in cases of cerebral tumour, against the risk of too rapid and too great lowering of intracranial tension. Abnormally low pressures are sometimes encountered, but their significance has not yet been ascertained.

In cases of suspected spinal compression the "Queckenstedt test" is of great value. This consists in getting an assistant to compress the veins of the neck on both sides at first lightly and then if necessary more deeply. Normally even light compression causes the fluid to rise rapidly in the manometer tube, falling as suddenly when the pressure is removed. But when the space between dura mater and spinal cord is narrowed or obliterated by tumour or spinal caries or even by meningeal adhesions there is no rise of fluid in the manometer on light pressure and only a sluggish rise followed by an equally sluggish fall results on deeper pressure. Often the fluid does not return completely to the original level, or after rising slowly it may not fall at all when the pressure is relaxed. The latter phenomenon is practically diagnostic of a meningeal tumour. It appears to be due to the ball valve effect of a tumour in the spinal canal, and may be associated with an abnormally high initial pressure. In cases of complete blockage of the spinal canal the deepest jugular compression that the patient can stand fails to cause any rise of fluid in the manometer tube.

Naked-eye Examination of the Fluid.

Yellow coloration, however slight, is abnormal and indicates either pre-existing hæmorrhage or excess of protein or both. The formation of a *coagulum* on standing is also a valuable indication. In a clear colourless fluid it is characteristic of meningitis, especially the tuberculous and syphilitic forms, or of poliomyelitis. When occurring in a yellowish fluid it indicates considerable excess of protein along with some cell increase.

* Part II.—The Pathologist's Results—will appear next week.

Turbidity may be due to pus cells or to red blood corpuscles. These are sometimes not easily distinguished at first sight, but the colour of the deposit after the fluid has stood will indicate which of the two is present. A turbidity which does not clear on standing or even after centrifugalisation is probably due to the presence of micro-organisms; this condition is occasionally encountered in fulminant cases of pneumococcal meningitis.

Blood admixture may be due either to pre-existing subarachnoid hæmorrhage or to injury to a vessel by the lumbar puncture needle, and it is of the utmost importance to distinguish these two forms. If the blood admixture varies but little from the beginning to the end of the tap (or puncture), and more especially if the clear fluid, after the corpuscles have settled, is tinged with yellow, the diagnosis of pre-existing meningeal hæmorrhage is certain. If the upper fluid is colourless and the amount of blood admixture varies from the beginning to the end of the puncture it is evidence of accidental injury to a vessel and of no diagnostic significance. It is remarkable how often blood-stained fluids have been thrown away as useless or only examined for bacteria when a physico-chemical examination would have settled the diagnosis beyond question.

The information given by each of these various abnormalities is often much increased when two or more are combined. Thus the fact that a clear fluid which forms a cob-web coagulum on standing was removed at normal pressure may turn a possible diagnosis of tuberculous meningitis into the almost certain one of poliomyelitis. It is clear that only in special cases can a final diagnosis be reached at the bedside, but much presumptive evidence can often be gained, and this may serve as a guide to immediate treatment.

Some Examples.

A few examples drawn from experience in which the diagnosis was arrived at by observations made during the puncture will help to illustrate these points.

CASE 1.—A lady with slowly ingravescent paraplegic symptoms complained that one of her chief troubles was pain running round one side of her trunk when she coughed. On lumbar puncture a yellow fluid rose slowly in the manometric tube, pulsating very slightly with the arterial pulse, and jumping slightly on coughing. Compression of the jugular veins, sufficiently deep to cause cyanosis of the face, produced no movement in the manometer. The fluid set in the tube into a firm jelly soon after it was drawn off (Froin's "massive coagulation"). The diagnosis of spinal tumour between the cord and the dura mater made at the time was confirmed a few days later by an operation at which the tumour was successfully removed.

CASE 2.—A lady between 50 and 60 years old found that her legs were becoming gradually more stiff. But her chief complaint was of a sharp shooting pain which ran round under her shoulder when she coughed. For this reason "she dreaded having a cold." On lumbar puncture the cerebro-spinal fluid rose rapidly in the manometer to a height of 250 mm. It showed good respiratory pulsations, but no arterial pulsations whatever. Light bilateral compression of the jugular veins caused no movement of the fluid in the manometer, but deep jugular pressure caused it to rise rather slowly to 280 mm. When the pressure was released it fell slowly and irregularly, but did not return to the original level. After the removal of 5 c.cm. the pressure fell to 150 mm. In this case the fluid was colourless and did not form a coagulum, but examination later showed the protein to be considerably above normal. This was a good example of the "ball-valve" effect of a meningeal tumour, the high initial pressure being due to the efforts which the patient had made in getting into position for the lumbar puncture. A meningeal tumour attached to one of the posterior roots at the upper thoracic level of the spinal cord was successfully removed a few days later.

CASE 3.—A child of 3 years had been ailing for about a week with vague symptoms which suggested a gastro-intestinal upset. She was querulous and inclined to be drowsy. On lumbar puncture the fluid, which was slightly yellow and formed a fine coagulum after withdrawal, rose at first very slowly, but gradually reached the high level of 310 mm. while the child lay quite comfortably and breathing easily. The diagnosis of cerebral mischief, either tumour or meningitis, was made at the time; the slowness of the rise suggested a meningitis which had caused some spinal meningeal adhesion, and subsequent examination of the fluid gave evidence of tuberculous meningitis.

CASE 4.—A lad of 20 had been ill for five days complaining of severe headache and stiffness of the neck which had come on gradually one evening. He had had no pyrexia at first, but during the last 36 hours before lumbar puncture was performed the temperature had risen twice to the neighbourhood of 100° F. On lumbar puncture the fluid was evenly blood stained and rose rapidly to over 300 mm. 25 c.cm. were removed after which the pressure was still 200 mm. The fluid as seen in the test-tubes was salmon pink, a yellowish tinge being apparent as well as the red colour due to blood admixture, and this yellow coloration became more evident as the corpuscles settled. A diagnosis of spontaneous subarachnoid hæmorrhage, probably due to rupture of an aneurysm on the circle of Willis, could therefore be made at once.

CASE 5.—A man of about 50 had for some weeks become increasingly drowsy and used to pass into periods of deep sleep from which it was difficult to rouse him. In one such comatose attack a lumbar puncture was performed. The fluid was clear and colourless and was at a pressure of 235 mm. After the removal of 5 c.cm. the pressure had dropped to 140 mm. and the patient wakened up and talked rationally. The diagnosis of cerebral tumour, which was made chiefly on this rapid drop in the pressure, was subsequently confirmed.

What to Demand from the Pathologist.

When a specimen of cerebro-spinal fluid is sent to a pathologist for examination it is advisable that he should be told as much about the clinical nature of the case as possible. This is much better than merely asking him to perform certain tests on it, as most pathologists nowadays are fully conversant with the examination of the cerebro-spinal fluid, and the decision as to the methods of examination to be employed should rest with them. But unless the clinical nature of the case is known some important examination may be omitted or left so late that insufficient fluid remains for the test. The more important lines of examination may, however, be indicated. These will depend on whether the case appears to be one of cerebral or spinal disease and on the acuteness of onset and course of the malady. In every case a total and differential cell count, and an examination for total protein and globulin excess should be made. Where there is any possibility of septic infection a cultural examination and an examination of stained films for organisms should be asked for; these examinations should be made as soon as possible after the fluid is obtained.

In the more acute cerebral conditions it is usually wise to make a fairly complete quantitative chemical examination including estimations of chlorides, glucose, and urea. In suspected meningitis also the chlorides and glucose should always be estimated, as the degree of reduction of these substances gives an indication of the severity of the disease. An estimation of the urea has often proved that cerebral symptoms were due to unsuspected uræmia, a condition in which there is usually also a rise in the chloride percentage. It is a well-established fact that the urea percentages are always identical in the blood and the cerebro-spinal fluid. Consequently the examination of the one makes that of the other unnecessary. In spinal lesions and in many of the more chronic cerebral conditions these chemical examinations are unnecessary, but a Wassermann reaction should almost always be performed and one of the colloidal reactions (gold, benzoin, paraffin, or mastic) may help to distinguish the type of syphilitic lesion or, in the presence of a negative Wassermann reaction, may indicate that the case is one of disseminated sclerosis.

The minimum examination therefore that may be considered complete in a spinal case or in a chronic cerebral case includes: (1) total and differential cell count (0·5 c.cm.); (2) estimation of total protein (1 to 2 c.cm.); (3) one or more tests for globulin excess (0·5 c.cm.); (4) Wassermann reaction (1 to 2 c.cm.); (5) a colloidal test (0·1 to 1 c.cm.). Thus 5 or 6 c.cm. of fluid are quite sufficient for all these examinations.

Opening of the Medical Schools.

PAST AND PRESENT.

An Address to Students of University College Hospital on Oct. 1st

BY SIR THOMAS BARLOW, BART., K.C.V.O., F.R.S.,
CONSULTING PHYSICIAN TO THE HOSPITAL.

DURING the last few months there has been celebrated with becoming dignity and moderate completeness the centenary of the University of London and of University College. On this, the opening day of the winter session of the medical department of this College, it has been judged fitting that I should refer to some of the salient points arising from the fact that the medical classes were started close by here just 100 years ago.

A century ago, although no doubt London was a great centre for medicine and surgery, education in these subjects was very poorly organised. There were four great hospitals—St. Bartholomew's, Guy's, St. Thomas's, and the London—and to these hospitals eminent physicians and surgeons were attached, part of whose duty was to give instruction to the students. There was a certain amount of ambulatory instruction, such as we should now call clinical teaching, given to the men who in the current phrase, "walked the hospitals"; but this was sometimes rather perfunctory. A physician to one of the four hospitals that I have mentioned, on entering his ward, found a number of students assembled with a view to accompanying him in his round. The physician was accustomed to place himself with back to the fire and wait until every student had disappeared; then he began his round.

The surgeons were better; they welcomed students to the operating theatres to behold the celerity and dexterity with which they got through operations such as the amputation of a limb. In those pre-anæsthetic days the chief interest was to note the number of seconds which were taken in the principal part of the operation. A number of surgical dresserships to in-patients were allotted. These posts were entirely in the gift of senior surgeons and were only held by their apprentices. Sometimes a heavy fee was exacted for such an appointment.

In those days a great portion of the medical teaching, especially in the early subjects, was carried on in private medical schools, which were the property of surgeons and occasionally of physicians. One of the most important was in Windmill-street and was the property of the celebrated John Hunter. Anatomy and physiology were the most important subjects, but at some of these schools medicine and surgery, botany, chemistry, and obstetrics were also taught.

These private medical schools have all vanished. One of the last of them still existed in this neighbourhood when I was a medical student more than 50 years ago, but it did not flourish. It was attended by idle fellows who had repeatedly failed at their examinations, but who by a process of cramming ultimately scraped through. It was a stigma in my day for any man to attend such a place. If you read the novels of Smollett and the later ones of Albert Smith and Charles Dickens, and look at Rowlandson's pictures of eighteenth century life, you may well conclude that the medical student of those times was not a cultured or attractive personality.

The Medical Faculty and Hospital of University College.

When our founders had erected the initial buildings of the University of London in this neighbourhood, one of their earliest problems was the organisation of the medical faculty. They founded no less than 11 professorships in medical subjects, and these chairs were filled by the appointment of 11 men, each one distinguished in his own subject. Each professor taught only his one subject with one exception. That was Sir Charles Bell, who for a time taught physiology as well as surgery. Within seven years of that date there were a few changes in the personnel of the professoriate, and then the greatest Roman of them all, William Sharpey, who came to us from Edinburgh, was appointed to the chair of physiology.

For 40 years Sharpey was a tower of strength to this College. He was not only an inspiring master in exposition and demonstration of his subject to many generations of students, but he was also a teacher of teachers to several of the London medical schools.

Our founders soon realised that no course of medical study could be complete unless it included opportunities for learning the signs of injury and disease as well as the proper methods of handling the injured and of treating the sick. They accordingly secured a house in George-street, close by, and besides opening an out-patient clinic, they provided a few beds where cases could be studied and treated. In this out-patient clinic our students were taught practical medicine by Dr. C. J. B. Williams and practical surgery by Sir Charles Bell. In a short time a great step was taken by arranging for our students to attend in the wards of Middlesex Hospital, and there also clinical instruction by the two distinguished men whom I have mentioned was given.

But our founders were not content until, with courage, faith, and enlightenment, they had built the central block of University College Hospital.

You will not forget that in a very real sense the hospital was the child of the College, and you will realise that this close link helped to maintain a scientific basis for the investigation and remedial work of the hospital. Thus was brought about by our founders the great work not only of constituting a faculty of medicine but of instituting a medical curriculum and of providing a liberal education in the science and art of medicine.

Development of Medical Work at the College.

I shall not take up your time by detailing the successive steps of the evolution of this school of medicine. They consisted essentially in making more and more facilities for gaining practical experience in every department. Let it be remembered that these new facilities were not carried out at the demand of the examining bodies, but on the contrary, after they were started, they acted as stimuli to the examining bodies to deepen and widen the requirements of medical education. It meant more laboratories and lecture rooms, more teacherships for practical work. The new work included especially pathology and its many divisions, and the appointment of Sir Robert Carswell as the first ad hoc professor of pathology gave the keynote.

Nor shall I trouble you with the complex changes in the University of London. Suffice it that the last step as far as we are concerned has been the separation, for the sake of convenience of the early medical studies which are still housed in the College from the later or hospital group of studies which now find their local habitation in the hospital itself and in the University College Hospital Medical School in a new building in University-street. On the still further development arising out of the complete rebuilding and enlargement of the hospital I cannot dwell, but I should like to emphasise the importance of the incorporation of the National Dental Hospital and School, the staff and students of which we welcome as our colleagues to-day; the auxiliary annexes of the finely equipped Hospital for Women's Diseases, and of the Royal Ear Hospital cannot be ignored, nor can the great increase of valuable resident and non-resident appointments and the increased opportunities for increased research and learning.

Advice to the New Student.

And now I can well imagine that anyone of you may say: "What advice can you give me as to the best way in which I can carry through the vital studies which I began to-day?"

Well, I assume that you, who are freshmen, intend to take the M.B. and, ultimately, the M.D. of the University of London, and that you propose to take in your stride the qualifying examinations of the Conjoint Board of the Royal Colleges of Physicians and Surgeons. The conjoint diploma will give you a qualification to practise; it will make you eligible to compete for resident hospital appointments, and it will prove invaluable as preparation and preliminary test for the more formidable examinations of the University of London.

You have studied the prospectus of medical studies and you fully realise that in your first winter your most important subjects are anatomy and physiology. In education for medicine, as in every scientific professional study, there are four things which you ought specially to cultivate. The first is *technique*. You must spare no pains to become neat-handed in dissection and experiment. Secondly, you must cultivate the faculty of rapid, accurate *observation* of salient points, gathering in as much detail as possible. Thirdly, you must specially cultivate that part of the faculty of memory which is concerned with *visualisation*. For example, you must acquire the power of summoning at any moment a mental vision of what you have yourself displayed in dissection, or what you have seen in the dissections made by your fellows. Fourthly, you must learn to record accurately and tersely what you have yourself dissected or what experiments you have yourself performed.

I should like to develop this in a little more detail. During your first month you will begin to attend your lectures on anatomy and physiology, and you will have to learn thoroughly the bones of the human skeleton. These you must recognise instantly in the dark as well as in the daylight—what the bone is, to which side of the body it belongs, the name and shape of every eminence and groove upon the surface. Observation requires not only cultivation of vision but of tactile sensibility. After a month or six weeks a "part" will be allotted to you for dissection, probably a limb, and now you have ample opportunity for the cultivation of the methods which I have enumerated. I cannot exaggerate the importance of your becoming a neat dissector. You will learn your anatomy much more quickly and you will find it helpful, not only during your studentship, but throughout your professional life.

A man who can sketch is at a great advantage in learning his anatomy, but the next best thing is to be able to make a good diagram, which shall show, not only the shape of the structures displayed, but their relations to adjacent parts.

As to the visualisation I cannot speak too forcibly of the advantage from conjuring up mental visions of the different stages of your dissection. On rising and on going to bed, and as you take your walks, you ought to recall all these mental pictures.

In regard to the fourth method, that of recording the output of your dissections, you will find the following plan simple and worthy of trial. Take a hint from commercial book-keeping. Procure a large-sized exercise book, which for simplicity call your day-book. Every night write down what you remember of the day's dissections, including copies of such diagrams as you have made: then, with the aid of your text-book, write on the opposite page the necessary omissions and corrections. I assure you that if you persevere with this simple method of record and correction you will improve your memory, facilitate your anatomical acquisitions, and lessen the drudgery of your work.

In your first term you are dependent in physiology on lectures and demonstrations by your professor. In your first summer term, however, in the class of practical physiology, you will have the opportunity of making such experiments under skilled guidance as are necessary. You can apply in your own way the same fundamental methods in their bearing on physiology as those which I have pointed out in regard to anatomy.

The Uses of Lectures.

I should like to say a word as to lectures *versus* text-books. The great authority of Dr. Johnson is quoted in disparagement of lectures, but Johnson had the wisdom to draw a distinction between lectures illustrated by experiments and those not so accompanied. I am quite convinced that in one's studies the combination of the use of text-books with lectures is the right one. The lecturer can give illustrations and additional explanations which are lacking in the text-book. He knows when emphasis is most necessary, and experience has taught him where the student is apt to go wrong or to forget the relative importance of facts or observations. Moreover, the student derives not only the benefit of emphasis but the association of the lecturer's personality with the subject he is teaching. The subject may not be presented so logically nor so consecutively as in the text-book, but actual illustrative experience is often of definite advantage. The truth is that both are helpful and you cannot afford to dispense with either. Demonstrations, and especially catachetical demonstrations, you must never neglect. Do not be afraid of a little gentle ridicule at your mistakes and those of your fellows. Such associations help to stamp bits of knowledge often indelibly in our memory.

I must say one word about the great danger of *slackness* in the first winter session. Men often conclude that because the same subjects reappear in the medical programme for the second and third years they can repair the half-heartedness of their first winter by harder work in the summer and second winter. It is a profound mistake; the work of every term has been carefully graded and the postponement of early examinations or your failure in them may severely handicap your whole career as a student.

Work in the Wards.

Now I will pass over the later work of your early studies. I assume that you have passed your early conjoint and second M.B. examinations. You are now ready at the beginning of your third winter to attend lectures on medicine and surgery and also to start your hospital work. You must be ready immediately to begin at the hospital the junior class of clinical medicine, and you must not omit a single meeting of this class. You will learn the elements of physical examination of the organs of the chest and abdomen in health and disease, and this is work which you will be following during a great part of your professional life. Within a month or six weeks you will receive your first hospital appointment as clinical clerk in the wards or in the out-patient room, either medical or surgical. The combination of ward and out-patient work under the same chief is, I am convinced, one of the most beneficial recent modifications of the medical curriculum.

Assuming that you get a medical clinical clerkship, you will take your instructions primarily from your house physician, and I advise you to become his humble and devoted slave. Seventy per cent. of what you learn in the medical wards comes from what you learn from him in the morning rounds. You will have, amongst other duties, to take histories of the cases allotted to you. Don't be too proud to correct omissions and blunders in your histories, and when writing under dictation the "present states" be sure to verify sooner or later the bearing of the physical signs which are dictated to you. In a few days your chief will make one of his regular clinical visits. There may be inevitable criticisms of history and "present state" and you may have to bear the brunt of question and criticism. Do not be afraid of asking for enlightenment, but don't be so foolish as to argue. I never forget occasions when Sir William Jenner had pretty well turned inside out a poor clinical clerk, and the clerk, humiliated and dismayed, received Sir William's kindly comfort: "My dear fellow, you will never forget this all through your life. It was with that object that I bothered you so with questions."

Some of your cases will die. Never omit a single post-mortem examination. In your private note-book enter as many details as you can remember. Write down your chief's clinical remarks, but especially note the mistakes that were made in the ward in the light of the post-mortem findings and if possible how those mistakes came to be made. When you have finished your junior clinical class and your clinical clerkship, you may be able to sandwich in a three months' post-mortem clerkship, and you ought about this time to make yourself thoroughly efficient in urine analysis and blood counting, &c., which really belong to your clinical clerkship.

The Importance of the Special Departments.

You cannot begin too soon to get thoroughly skilful in handling the instruments of special investigation—the laryngoscope, the ophthalmoscope, the otoscope, and the sphymograph. If you begin early you will get many more chances of testing your efficiency in the successive clinical posts which you hold. If possible by all means get a clinical clerkship in the children's ward and try also to attend the infant clinic. Take as many opportunities as possible of attending the skin clinic. Besides becoming familiar with the different types of skin disease, you will find it an excellent supplement in the study of diathesis and associated diseases, and it is valuable for learning practical points in therapeutics. On no account miss your opportunities of attending demonstrations of fever at a fever hospital. It is absolutely imperative that you should be familiar with the naked-eye signs as well as the stages of the acute specifics.

You will during the next summer be taking lectures and practical pathology, and this is coördinated with your hospital work. I have said nothing about your surgical appointments; it is beyond my province, but I will say this, whilst you are doing your surgery you must give your heart and soul to it and at the same time keep your clinical medical knowledge in full working order. Remember that every surgical case gives opportunity for general clinical investigation.

You must not omit the opportunities which you get of demonstrations of typical cases of mental disease, and you must make yourself familiar with the thorny requirements of certification. I should also like to say that when the time comes for your obstetric lectures and subsequently for your practical midwifery, you will find that the care of midwifery cases is one of the very best preparations for your future practice amongst poor people and also amongst the well-to-do. The obstetric work is a grand opportunity for cultivating kindliness and humanity as well as technical skill.

Some Further Recommendations.

I cannot conclude these practical hints without begging you to take every opportunity of the invaluable mental gymnastic which writing commentaries for the senior clinical class affords. Nothing helps more in the rounding off of your knowledge. During your early hospital work keep to the medical text-book recommended by your professor of medicine. When you are working up your commentaries go further afield and read some of the original memoirs. Don't disparage the out-patient clinics. They and the skin clinics are very closely allied to your daily work in general practice. They constitute the great school of acquiring and testing your knowledge of the naked-eye signs of disease. Sir William Jenner used to give us his experiences of morning practice in his own consulting-room. The consulting-room was long, and from the time of the patient entering the room till he took his seat Sir William watched his behaviour and his gait and often gained thereby a hint as to his first questions and his initial lines of investigation. Sometimes these hints were elusive and he had to start on a fresh tack; often they were suggestive and fruitful.

I hope you will set your ambitions towards obtaining at least one hospital resident appointment. Best of all, try to get a house physicianship, a house surgeoncy, and an obstetric resident's post, and having held all the resident and non-resident posts that you can obtain at University College Hospital if your time and means allow, get a post at one of the special hospitals, where you will receive a small salary, preferably at a hospital for children. A resident post at a fever hospital or at one of the poor-law infirmaries give also invaluable clinical opportunities.

I can hear you say: "Who is sufficient for these things?" You are all sufficient if you will learn by blunders and chronicle in your own records your mistakes. Be sure to index your note-books—names of persons if possible, but another section for diseases. Be determined to maintain your own health at the maximum of fitness. Keep Saturday afternoons for athletics and country walks. Burn very little midnight oil. Avoid scratch meals and the doctor's bad habits of bolting food. A cigarette after lunch and dinner has its place, but don't smoke whilst you are working. Take the minimum of alcohol and only with food, and best of all try experiments on yourself of doing without.

Save a little time every day for general reading, the Bible first of all, then Shakespeare, and the great English essayists, poets, and historians, Bacon and Addison, Boswell's Johnson. Don't forget Montaigne and Erasmus's Colloquies, and Balzac's "Médecin de Campagne," the most beautiful picture of a country doctor's life. Godlee's "Life of Lister," one of the best biographies in the English language, will make a special appeal to University College Hospital men. Good music and good drama have their occasional rightful place.

You must cultivate good friendships. Join the Union and be faithful to it, but keep your links with home firm and constant. Tell your people about every part of your work and play and about your teachers and fellow students.

The preparation for a doctor's career is arduous and exacting, but I assure you that there need be no drudgery. In the acquisition of medical knowledge there is something of the joy of discovery and, moreover, there is the comfort of realising that through that knowledge you will have the power of saving valuable lives and of relieving much suffering.

PHYSIC AND PHILOSOPHY.

Abstract of an Address to Students of King's College Hospital on Oct. 3rd

BY ERNEST BARKER, LITT.D., LL.D.,
PROFESSOR OF POLITICAL SCIENCE IN THE UNIVERSITY OF CAMBRIDGE.

THE Greek word φύσις was originally connected with growth or becoming; but it soon widened out, exactly like the similar Latin word *natura*, which also means growth or becoming, to include all nature, inanimate as well as animate. It is from this word that we derive "physic" and "physician." Physic is the study of the processes of nature—the process of becoming, of growth, and of what Aristotle calls corruption—as it shows itself in the human body; and a physician is a man concerned with those processes—partly by way of understanding them, which is science, and partly by way of altering or affecting them in virtue of his understanding, which is art. The man who first isolated these processes for the purposes of an inquiry which we may call genuinely scientific was Hippocrates. As the Greeks themselves put it, he first separated medicine from philosophy. This means that he took out of the whole body of curious inquiry into φύσις at large, which the early Greeks called philosophy, the one subject of the physical processes of the human body, and said "This is enough for me." It does not mean that he thought medicine had nothing to do with philosophy in the sense of that word in which it means general reflection about life and the world. On the contrary, he was in that sense of the word a very philosophical doctor—as indeed it is always good that doctors should be also philosophers, though we cannot invert the proposition

and say that philosophers should also be doctors. But they might be better philosophers if they were.

There are two treatises, ascribed to Hippocrates, which I should like to mention. One is called "Concerning the Holy Disease," and deals with epilepsy. Of this disease Hippocrates says:—

"It seems to me no whit more divine or holy than other diseases. Other diseases as well have their φύσις from which they arise, and this, too, has its φύσις and cause. Men thought it was a sort of divine visitation through their inexperience and astonishment, because it is unlike the rest; and so far as they stay there, in a state of helplessness about understanding it, its divinity is preserved; but so far as they get some facility in the way of remedies by which they try to cure it, its divinity is destroyed. If it is to be thought divine through its astonishing character, holy diseases will be numerous on that score. I will show you other diseases no less astonishing which nobody thinks to be holy. Take fevers." . . .

And away he goes into fevers.

Now this seems to me to show a scientific temper; and the other treatise which I will mention, upon "Airs, Waters, and Places," is equally scientific. These natural facts, the writer tells us, produce such and such effects: winds, rainfall and contour all influence human character, and men's ways of living. But he is no determinist, and he acknowledges frankly that human institutions and laws may remedy the defects which climate left to itself will always tend to produce. This is just what we should expect a good doctor to say; the general environment in which you are living, he will tell you, is producing such and such results, but I can give you the rules of a regimen, corresponding in their way to the institutions and laws of a community, which will modify those results.

Now this attitude of the good doctor, which we find in Hippocrates and his school, is just like the general attitude of all Greek scientific inquiry; and I should not wonder if it had much to do in producing that general attitude. Let me mention some of the features of Greek scientific inquiry, as it appears, for example, in Aristotle; and let me try to show where it approximates, and may be indebted, to the methods and attitude of medical inquiry in the school of Hippocrates.

In that school the members were adepts in accurate observation. Observation, and explanation based on observation—these were their excellencies. All this, I believe, affected Aristotle—affected him directly in his zoological studies and perhaps indirectly in his studies of politics. He was himself an Asclepiad by birth, the son of the court physician of the King of Macedonia, and when he founded a philosophical school of his own in the Lyceum in Athens, as he did in his fiftieth year, he seems to have included medicine in its scope. If this is so we may say that the Lyceum—the earliest university of the world next to Plato's Academy—was the first to give any system of university education in medicine, treated side by side with other branches of knowledge.

I am inclined to think that we can find traces of the doctor—or at any rate of the zoologist who would hardly have been a zoologist without the doctor's aid—in the pages of Aristotle's "Politics." Just as the doctors of the school of Cos observed their cases, recorded their observations, and drew their conclusions, so Aristotle made, or had made for him, observations of 158 constitutions, and on the basis of these constructed the theory of the "Politics." He divides constitutions into normal and perverted, much as a doctor might divide men into healthy and diseased. He is particularly interested in perversions, as a doctor is particularly interested in diseases, and the fifth book of the "Politics," which is devoted to these perversions, has been called his study of the pathology of the State. But the doctor not only studies diseases; he seeks to prescribe remedies. In the same way Aristotle not only studied political perversions, such as greedy tyranny and selfish *ologarchy*; he also prescribed his cures. His prescription, we may say, is a moderate diet. Tyranny is rooted in power and nourished by power, but the less the tyrant presses his power—the more, as it were, he reduces his consumption of power—the more firmly will his power be grounded. Est modus in rebus.

When Aristotle classifies constitutions by their difference in structure, and in the light of the various forms of the governing organs of the body politic, he seems to be following a biological way of arrangement. Indeed, his whole philosophy, with its genetic trend and its insistence on the idea of development from embryonic beginnings towards the goal of a perfect adult form, may also appear to be derived from the study of embryology.

[Here Prof. Barker traced the influence of Aristotle on medical thought in the Middle Ages and proceeded to speak of the work of Linacre and Sydenham, two English doctors who might, he thought, have said to Medicine, "I could not love thee, dear, so much, loved I not learning more." He concluded:—]

There is one word of advice which I should like to give, and one word of gratitude I should like to say. My advice is simple. Clothe your physic with some philosophy—some love of general wisdom. There is no nobler figure in life than the wise doctor who has kept breadth of interest and a general capacity of mind. I think of Sir Thomas Browne; I think of one I knew, Sir William Osler. There is a large function in modern life for the doctor who is also a philosopher. We have had a great age of physics; I expect we shall next have a great age of biology. Biology, the science of the living organism, matters greatly to modern society, with all its problems of stock and breeding and true hygienic growth. Medicine is the science of the highest living organism, and it matters intensely to all human society that the science should be broadly cultivated and should reach out to all the problems of social life which it touches. A doctor owes a duty to society at large as well as to individual patients, and he should understand something of the nature of society at large if he is to do his duty—something about its problems, something of what he can do for their solution. That is where physic touches political philosophy; but it also touches philosophy at large, and the general understanding of the mind of man as it works in the world man has made.

I ask you to do something, but I also want to thank you for what you have done. One of the Hippocratic sayings is—

ἢν γὰρ παρῇ φιλανθρωπίη, παρέστι καὶ φιλοτεχνίη,

which is to say, if you have love of man, you have love of your art. The physician's humanity is wrapped up with his skill, and each of us can recall the thousand little *not* unremembered acts of kindness and of love that he has received from a great profession.

I have sometimes thought of doctors as pelicans—ready to pluck their breasts, as the pelican does in the myth, for the sake of their charges. All honour to them for it. But analogies are seldom perfect, and metaphors are often misleading. I therefore beg you, as I conclude—I beg you earnestly—to forget that one of the features of pelicans is—the length of their bills!

THE TROPICAL FIELD: ITS POSSIBILITIES FOR MEDICAL WOMEN.

Abridged from an Address to Students of the London (R.F.H.) School of Medicine for Women on Oct. 1st

BY ANDREW BALFOUR, C.B., C.M.G., M.D., F.R.C.P.,
DIRECTOR OF THE LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.

Dr. Balfour spoke first of the recent improvements in the hygiene and sanitation of tropical countries, and welcomed the application of medical and physiological research to the problems of tropical diseases. Until comparatively recently, he said, an imaginary gulf was fixed between the diseases found in countries with temperate climates and those commonly encountered in the torrid zone, but we have come to realise that it is not so much a case of diseases peculiar to

Some of your cases will die. Never omit a single post-mortem examination. In your private note-book enter as many details as you can remember. Write down your chief's clinical remarks, but especially note the mistakes that were made in the ward in the light of the post-mortem findings and if possible how those mistakes came to be made. When you have finished your junior clinical class and your clinical clerkship, you may be able to sandwich in a three months' post-mortem clerkship, and you ought about this time to make yourself thoroughly efficient in urine analysis and blood counting, &c., which really belong to your clinical clerkship.

The Importance of the Special Departments.

You cannot begin too soon to get thoroughly skilful in handling the instruments of special investigation—the laryngoscope, the ophthalmoscope, the otoscope, and the sphymograph. If you begin early you will get many more chances of testing your efficiency in the successive clinical posts which you hold. If possible by all means get a clinical clerkship in the children's ward and try also to attend the infant clinic. Take as many opportunities as possible of attending the skin clinic. Besides becoming familiar with the different types of skin disease, you will find it an excellent supplement in the study of diathesis and associated diseases, and it is valuable for learning practical points in therapeutics. On no account miss your opportunities of attending demonstrations of fever at a fever hospital. It is absolutely imperative that you should be familiar with the naked-eye signs as well as the stages of the acute specifics.

You will during the next summer be taking lectures and practical pathology, and this is coördinated with your hospital work. I have said nothing about your surgical appointments; it is beyond my province, but I will say this, whilst you are doing your surgery you must give your heart and soul to it and at the same time keep your clinical medical knowledge in full working order. Remember that every surgical case gives opportunity for general clinical investigation.

You must not omit the opportunities which you get of demonstrations of typical cases of mental disease, and you must make yourself familiar with the thorny requirements of certification. I should also like to say that when the time comes for your obstetric lectures and subsequently for your practical midwifery, you will find that the care of midwifery cases is one of the very best preparations for your future practice amongst poor people and also amongst the well-to-do. The obstetric work is a grand opportunity for cultivating kindliness and humanity as well as technical skill.

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I hope you will set your ambitions towards obtaining at least one hospital resident appointment. Best of all, try to get a house physicianship, a house surgeoncy, and an obstetric resident's post, and having held all the resident and non-resident posts that you can obtain at University College Hospital if your time and means allow, get a post at one of the special hospitals, where you will receive a small salary, preferably at a hospital for children. A resident post at a fever hospital or at one of the poor-law infirmaries give also invaluable clinical opportunities.

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PHYSIC AND PHILOSOPHY.

Abstract of an Address to Students of King's College Hospital on Oct. 3rd

BY ERNEST BARKER, LITT.D., LL.D.,
PROFESSOR OF POLITICAL SCIENCE IN THE UNIVERSITY OF CAMBRIDGE.

THE Greek word φύσις was originally connected with growth or becoming; but it soon widened out, exactly like the similar Latin word *natura*, which also means growth or becoming, to include all nature, inanimate as well as animate. It is from this word that we derive "physic" and "physician." Physic is the study of the processes of nature—the process of becoming, of growth, and of what Aristotle calls corruption—as it shows itself in the human body; and a physician is a man concerned with those processes—partly by way of understanding them, which is science, and partly by way of altering or affecting them in virtue of his understanding, which is art. The man who first isolated these processes for the purposes of an inquiry which we may call genuinely scientific was Hippocrates. As the Greeks themselves put it, he first separated medicine from philosophy. This means that he took out of the whole body of curious inquiry into φύσις at large, which the early Greeks called philosophy, the one subject of the physical processes of the human body, and said "This is enough for me." It does not mean that he thought medicine had nothing to do with philosophy in the sense of that word in which it means general reflection about life and the world. On the contrary, he was in that sense of the word a very philosophical doctor—as indeed it is always good that doctors should be also philosophers, though we cannot invert the proposition

instances had important results. In any case, all cannot be pioneers. There is such a thing as consolidation of research, and there is much useful work to be done on the lower levels, while it is well to remember that the word research does not necessarily connote laboratories.

For example, field inquiries are much needed into the diseases in India caused by, or specially associated with, pregnancy. "Anæmia of pregnancy" is the largest single cause of death in childbirth. It somewhat resembles pernicious anæmia, but differs from it in its short duration, absence of remissions, the fact that it occurs in young persons, and that recovery, when it takes place, is complete. Dr. Balfour is herself investigating this important malady in Bombay. Osteomalacia, common in certain parts of India, absent from others, requires careful investigation. Puerperal beri-beri is a condition of which we know little, and so is "sutika," a puerperal disease found in Bengal, described 20 years ago but still awaiting elucidation. The cause or causes of eclampsia, so common in Bengal, should be explored, while the manifold conditions leading to the high infant mortality which is such a feature in the returns require that research of various kinds be carried out upon them. Much of this work can only be done by women, for only women can gain access to the material.

Here, then, would be an opening for those desirous of taking up research if only there was some organisation and some adequacy of funds. It must be clear that India has great potentialities for the medical woman, and equally apparent that, so far, little has been made of them. May we not hope that a cause which would benefit both the women doctors and those to whose needs, to whose dire necessities rather, they would minister will ere long receive the sympathy and support it so fully merits?

Africa.

Here we are at the beginning of things where women's work is concerned, except for isolated missionary effort. Still a start has been made under the auspices of the Colonial Office, both in West Africa and East Africa, and this audience should be gratified to know that women are engaged upon the same terms as men, and, speaking generally, have proved their worth.

The most advanced work is being done on the Gold Coast, where there are properly constituted maternity and child welfare centres and where three medical women are employed. Here also we find in a good post at Accra, as assistant pathologist, a lady doctor, a former student of the London School of Hygiene and Tropical Medicine. In Nigeria, where there are also three women, the work is more of a dispensary nature, but is developing into definite clinics for women and children. In Sierra Leone one medical woman is doing excellent work in connexion with infant and child welfare. If we turn to East Africa we find in Uganda two women engaged in dispensary and maternity and child welfare work, and one acting as assistant bacteriologist at Entebbe. There is one woman dispensary worker in Tanganyika, and in Kenya a medical woman has been appointed to organise child welfare work. It is not unlikely that women may yet hold special research posts in some of the African laboratories, and, while the development of women's medical work in Africa is bound to be slow, it is assured of a future under the ægis of the Colonial Office.

Private practice in tropical Africa is scarcely a feasible proposition at present, whatever may happen at a later date, while, from a purely mundane standpoint, missionary posts do not seem to be very attractive. Perhaps, however, they have their compensations.

Ceylon.—Malaya.—Hong-Kong.

There is little to be said about Ceylon. A woman doctor is the head of the women's hospital in Colombo, but political difficulties place a bar to the entry of women from this country into the local colonial service.

On the other hand, Malaya, from the woman's point of view, is rather a bright spot. There are about 16 women medical officers in Government employ, for the most part engaged in child welfare work and employed in hospitals for women and children. The number is likely to increase. So far no public health posts have been open to women in Malaya or the Straits Settlements. There are a few private practitioners, but private practice presents difficulties for women in this part of the world. Of Hong-Kong, Mrs. Minett, who is my chief informant, has not much to say. A woman holds a Government appointment as school medical officer, and there is a medical woman with an assistant in charge of native maternity hospitals. No infant or child welfare work has yet been organised, though there is a huge field. Private practice could be built up and would in time be lucrative, but the language is a difficulty and there will be increasing competition from Chinese women who are qualifying in medicine. Single-handed women's practice has been tried and abandoned several times. "A firm of women," says Mrs. Minett, "with capital enough to wait and to enable them to spend six months in learning the very difficult language, might do extremely well." Pioneers are needed who can afford to do voluntary work, and there is scope for ambulance training and general health training among the Chinese.

British Guiana.—West Indies.

The situation in British Guiana is much the same as elsewhere. There was for a space a part-time woman medical officer in Government employ for infant welfare work. She acted also as honorary physician to the tuberculosis dispensary. Now there is no salaried post for women though, as ever, there is plenty of work to be done. Opportunities for private practice exist, but it would, of course, be a slow-growing affair and require capital at the outset. Here and in the West Indies, as Dr. Stanton has told me, any hope must, for the present, lie in unofficial directions, and it is clear that such hope cannot be of a very comforting kind.

Conclusion.

Whatever the future may hold, let it be remembered that it is no use going to the tropics medically unprepared. That is fair neither to the doctor nor her patient. It is little short of criminal to send medical men or medical women to hot climates unless they know how to take care of themselves and how to diagnose and treat those diseases which, if they cannot strictly speaking be called tropical, yet are found chiefly in the tropics and require, nay demand, appropriate study for their correct understanding. It is not enough to be a competent obstetrician or gynæcologist, though that counts for much. There must be that special knowledge which is only acquired by special study and which, if properly assimilated and applied, spells efficiency.

LEISURE AND THE MEDICAL STUDENT.

Abstracted from an Address to Students of the Westminster Hospital on Oct. 1st

BY ARNOLD C. POWELL, M.A.,
HEAD-MASTER OF EPSOM COLLEGE.

THE world is calling out more insistently now than at any time in its history for educated men and women in all professions, and in that of medicine the need for all-round culture, for catholicity of intellectual sympathy, is at least as urgent as is the need in any other high calling. Is the supply worthy of the demand? Not altogether, I fear. In years gone by the country practitioner was, as often as not, the Nestor of his community, the universal encyclopædia, the arbiter of taste, confessor, comforter, general autocrat. His medical knowledge was often not great, his surgical skill rudimentary; but he was a wonderful and unique being, a vital force in the land. Infinitely inferior in technical skill and knowledge to the general practitioner of the present day, he had valuable qualities, nevertheless, that it would be well for men of our generation to cultivate. But, "Have they the time?" you may ask. Through all stages

hot countries as of maladies met with in lands which in certain respects are backward and undeveloped. Of the really important tropical diseases, so-called, we now know that there are only three which are strictly limited to the belt between Cancer and Capricorn—namely, African sleeping sickness, South American human trypanosomiasis, and African tick fever. Their limited distribution is to be explained in terms of their arthropod vectors, the tsetse-fly in the first case, some species of reduviid or blood-sucking bug in the second, the tick, *Ornithodorus moubata* in the third. Filariasis, another malady of the first rank, very nearly comes into the category, but the remaining truly tropical maladies, such as verruga, goundou, and ainhum, are of no great significance. Malaria, blackwater fever, dengue, phlebotomus fever, plague, relapsing fever, leprosy, ankylostomiasis, schistosomiasis, beri-beri, and even sprue and yellow fever are not strictly diseases of the tropics, although, partly on account of their ætiology, partly because of their association with unhygienic conditions, the result in many cases of an uncivilised environment, they nowadays prevail to a much greater extent in hot countries than elsewhere. One thing, however, is certain. They require to be specially studied, and tropical medicine can only be properly taught by those who have had experience of tropical conditions and are familiar with those ancillary sciences, entomology, helminthology, and protozoology, upon which much of it is securely based. In another direction our conception of tropical diseases, or at least of some of them, has altered, for we have come to regard malaria and, to a lesser extent, African tick fever as allies, in that we have added them to our therapeutic resources and employ them more or less successfully in the treatment of general paralysis of the insane and other late manifestations of the luetic state.

After reviewing a few of the salient features of tropical medicine in Africa, India, Ceylon, the Federated Malay States, Hong-Kong, China, British Guiana, and the West Indies, Dr. Balfour proceeded to discuss the possibilities in the tropical field for medical women. In his opinion, the outlook is not too promising, though it is slowly improving. India offers the greatest scope. Dr. Balfour acknowledged indebtedness to Dr. Margaret Balfour, who had supplied most of the following information on the opportunities for medical women in India. The work open to them includes: (1) the Women's Medical Service for India; (2) mission hospitals; (3) private practice; (4) public health work. There are also a few other openings, including research posts.

India.

1. *Women's Medical Service.*—An account of this Service will be found in THE LANCET of Aug. 25th (p. 419). It is supported by the Countess of Dufferin's Fund from a subsidy given by the Government of India. It is open to fully qualified medical women of British or Indian nationality and, at present, the subsidy permits of the employment of 44 medical women, of whom about 50 per cent. are chosen from India. Selections in this country are made by the Committee of the Countess of Dufferin's Fund, and applications should be forwarded through its honorary secretary, care of Major-General J. B. Smith, at the India Office. Those chosen are expected to have the kind of experience gained by holding house appointments. The Lady Hardinge Medical College at Delhi, where women students are prepared for the M.B., B.S. degree of the Punjab University, has a staff of eight professors or lecturers. Two members of the Women's Medical Service are supplied to the Agra Women's Medical School, which prepares for the L.M.P. qualification. One member is supplied to the United Provinces as superintendent of medical aid to women. Other details, including an estimate of the cost of living in India, will be found in the article to which reference has been made.

2. *Mission Hospitals.*—There are nearly a hundred of these staffed by medical women, and in many of them the standard is as high as in those of the Women's Medical Service. Medical missions served as the portal for women's medical work in India, which dates from 1869, when Dr. Clara Swain arrived from the United States of America.

3. *Private Practice.*—Here there are several difficulties. A medical woman from this country depending for a livelihood on private practice alone would find herself in a quandary. For one thing, she must know the vernacular of the district wherein she settles, and the habits and customs of the people. For another, she must have enough private means to live upon for some years, and to pay her way back home if necessary. For yet another, she will encounter rivals in the shape of the Indian women doctors, the numbers of whom are rapidly increasing. Needless to say, she should have some knowledge of tropical diseases. In other words, she should have attended a course of tropical medicine and hygiene before embarking on her venture. It is only in the large towns that private practice can be successful. In the smaller towns and villages the people are either too poor to pay adequate fees, or, illiterate, ignorant, and superstitious, they do not realise that good treatment demands and merits pecuniary reward. It is clear that, save in the case of persons somewhat specially situated, private practice in India does not hold out much hope to the medical woman. Dr. Margaret Balfour advises anyone embarking on the venture to try and get a temporary appointment in a hospital near the place where she intends to practise. This, she says, is often quite possible if the doctor is willing to act as house surgeon on a small salary.

4. *Public Health Work.*—Dr. Margaret Balfour writes on this subject: "Considering the high degree of maternal mortality in childbirth and the high infant mortality in India, it is astonishing that medical women are not more frequently employed in combating these conditions. We know that in England where the conditions are not so urgent several medical women are employed at the Ministry of Health whose duties are to inspect the work aided by Government, to weigh the facts disclosed by statistics, to watch the results of legislation, and to think out means and measures by which the existing state of things can be improved. In India not a single medical woman is attached either to the Public Health Department of the Government of India or to the public health departments of the provinces, and this in spite of the fact that evidence as to the conditions of childbirth and the domestic causes of infant mortality must be obtained by male officers at second hand. A very few medical women are employed under municipalities or charitable bodies in maternity and child welfare work, but are usually poorly paid. Such bodies usually employ a health visitor only, who often works without any supervision. Great interest is being taken in India in maternity and child welfare, but the real purpose of the movement—prevention, not cure—is not widely understood. The time is ripe for Government to take a more active part in this great movement, which might be done by forming a Bureau of Maternity and Child Welfare organised and run by a competent medical woman."

There are a few administrative posts for women, more or less concerned with aspects of public health, such as child welfare, the maternity welfare of women industrial workers, or the control of midwives, but these are mere drops in the bucket.

As regards *other openings*, there are 62 hospitals in India staffed by women doctors not attached to the Women's Medical Service nor to missionary societies. These hospitals are under provincial governments, municipalities, or Indian States. Some are good, others the reverse, and before a medical woman seeks one of these posts she should obtain full information from someone with personal knowledge of the conditions. One who wished to devote great wealth to a good purpose could not do better than contribute to the Countess of Dufferin's Fund. If, instead of 44 medical women, 444 were available in India, this might be one of the best ways of meeting the problems set forth in "Mother India," and of removing a reproach which exists and must exist so long as women and children labour under the sad disabilities which bar the way to progress, health, and happiness.

The Fitness of Women for Research.

There remains the question of research work, and here one may fittingly perhaps diverge for a moment to comment on the fitness or otherwise of women for research. It has often been said that women, owing to their mentality and temperament, cannot attain the highest flights in research work and rank with the great discoverers in science. Well, such a statement would have to be submitted to careful statistical scrutiny before its truth or falsity could be established, and in any case we know it is not true for individuals, as witness the work accomplished by Mesdames Curie and Phisalix, by Miss H. Chick, by Mrs. M. Mellanby, by Lady Bruce, by Dr. I. H. Pearce, by Miss M. Robertson and others, work of a high order which has in some

tion which, with all its shortcomings, has brought to man greater happiness and prosperity than any other form of empire control. And all the ramifications of our great system of administration, our King, our Parliament, our self-governing Dominions, our county councils, our borough councils, our literature, art, music, science, all have sprung from a proper appreciation, a proper use, of that great and abiding blessing. leisure.

THE ENEMIES OF MAN.

Extract from an Address to Students of the Middlesex Hospital on Oct. 2nd

BY A. E. WEBB-JOHNSON, M.B., F.R.C.S.,
SURGEON TO THE HOSPITAL.

IN his preoccupation with the larger animals and his perpetual fight to control the vegetable kingdom, little did early man think that his real enemies were microscopic animalcules and unicellular vegetable microbes, and that often the angels of death were of the insect world. Primitive man had to equip himself to fight the enemies visible to him. At long last, towards the end of the nineteenth century, the hands and brain of modern man fashioned instruments which brought the real enemy into view. The battle was joined, and man, instead of fighting something mysterious had the hosts of death captive. He could study them as tiny specks on a microscope slide, or hold them encaged in a test-tube—growing at his command, tamed, attenuated, robbed of their virulence, and oftentimes to be put to man's service.

All through the ages a golden truth is blazoned—the path of progress is by experiment, research, and trial. Research must be fostered and encouraged. While it is not given to all of us to add to the sum of human knowledge, we can all help research. We can all be seekers after truth and ready to explore with open minds the paths indicated by others. Too often a new truth has to fight its way to acceptance against unreasonable opposition, or some fixed opinion or bias, and—

> "Alas, what years you thus consume in vain
> Ruled by this wretched bias of the brain."
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It is therefore often

"not the man who first says a thing, but it is he who says it so long, so loudly, and so clearly, that he compels men to hear him—it is to him that the credit belongs." (Sydney Smith.)

A study of the history of the fight brings out another lesson. The coöperation of the sciences which dates from Harvey's time must be made closer and closer. It is by coöperation that advances can be made most speedily. Medicine is dependent on the fundamental sciences. From day to day we make greater demands on them for diagnosis and treatment. It may yet be that the dread enemy of cancer will be brought to understanding, prevention, and cure by the chemist and the physicist. Already it is known thet there is a difference between the chemical requirements of cancer cells and normal cells; already it is known that radium in proper doses has a lethal effect on cancer cells and spares the normal cells. Further work in biochemistry and biophysics may bring us a means of early diagnosis and successful treatment.

Still another point is clear. All through the ages man has required for his search more and more elaborate tools, instruments, and machines. To provide equipment of the finest order and laboratories of the best is now a costly matter. Here the men at the Base, the men of great generous hearts and far-seeing minds, can help and have helped. In our own medical school we have been blessed with great benefactors. The Joel Chair of Physics, the Chair of Physiology, and the Courtauld Chairs of Anatomy and Biochemistry are endowed, and you see brought to the service of mankind great institutes for scientific research and application—the Barnato-Joel Cancer Research Laboratories, fast becoming, with the development of radiotherapy, an institute of physics, the Bland-Sutton Institute of Pathology, and the Courtauld Institute of Biochemistry. By these institutes the fundamental sciences of chemistry and physics become closely linked with physiological. pathological, and clinical study, and are brought in very fact to the bedside. Much remains to be done and in no better way can large-hearted benefactors with the necessary vision contribute to the progress of the race and the winning through of the fight against man's enemies than by the gift and support of laboratories for the study, and of hospitals for the treatment of disease.

But we must ensure that the teachings of research are followed. Even the teachings of Pasteur have not been fully applied. It is nearly half a century since Koch discovered the tubercle bacillus. Surely it is time it was banished into the wilderness. The fight against man's deadliest enemies is a fight for all. It is not a fight for armies only, but for nations, a true League of Nations' task. Preventive medicine is our aim, and it is worth much labour and much sacrifice. The highest aims of preventive medicine can only be achieved by the coöperation of all health services. There must be a coördinating head which to act with full authority should be the State. The great hospitals are ready and willing to play their part by providing accommodation for clinics which it may be desirable to establish. It is for public authorities to make full use of the facilities available and to avoid duplication of services. By coöperation not only will research be stimulated and fostered, and all the resources of the great hospitals be at the service of a great cause, but medical education will go hand in hand with research and treatment for the benefit of all.

We have a glorious inheritance. I will not myself attempt to assess the value of British contributions to the common victory, but will quote the late Sir William Osler, who said:—

"Bichat, Laënnec, and Louis laid the foundations of modern clinical medicine; Virchow and his pupils of scientific pathology; while Pasteur and Koch have revolutionised the study of the causes of disease: and yet, the modern history of the art of medicine could almost be written in its fullness from the records of the Anglo-Saxon race. We can claim every practical advance of the very first rank—vaccination, anæsthesia, preventive medicine, and antiseptic surgery, 'the captain jewels in the carcanet' of the profession, beside which can be placed no others of equal lustre."

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of their career the generations past and gone had far more leisure than is possible to us; the fields of learning they had to explore were nothing like as vast as they are now; their actual jobs were softer; their training far less exacting. They were able, as we are not, to devote much time to the so-called "humanities," and so get a wide-angled view of life. Is it then to be wondered at that, when the enormous growth of examinational requirements is realised, the modern medical student develops a materialistic view of his life's responsibilities? In short, is there any longer time available for the medical student to be anything but a medical student?

That is the crux of the whole matter: is there time for general cultural development, for anything more than work and play? Yes—emphatically yes! There is not only time, but there is absolute necessity, if civilisation is to continue its upward evolutionary progress. Our days are too kinetic; a little more knowledge of the laws of statics would prove a salutary medicine for the modern disease of mobilophobia. It is the lack of control of the time of leisure at our disposal—however small it may be—that is one of the present-day curses. Sport, theatres, kinemas, dances, motors—all have their value, but the evil tendency nowadays is to over-estimate that value, to imagine that the only form of rest is slacking. Many of us, I fear, have to reach an advanced old age before the realisation comes that mental laziness may in the end prove the most tiring, the most enervating, of all human occupations.

What, then, is leisure, how has it grown into being with the ascent of man, and what lessons can we gather from the history of its development? "Freedom from *pressing* business, as distinct from sheer indolence," is to me a satisfying definition of the word. Leisure, unlike indolence, presupposes work; it gives one time to study the work of others. It is definitely rest from work; it is change of work—the highest form of rest; it must necessarily follow work. Properly employed—and it is not leisure if it is merely time wasted—it engenders more work, better work, nobler thoughts, higher ideals. And so we have the cycle complete; the storing up of latent energy which, in due course, is to be set free in the form of kinetic energy. Then, again, the period of apparent quiescence—the recharging of the accumulator.

Let us see if we can discover the place history gives to leisure in the economic foundations of our complex national life. These foundations I think we can make threefold. First, *capital*, the basis of all freedom, the possession of which means that we have not to concentrate our thoughts on the problem of the next meal. It is the incentive of capital—in its broadest sense—that has been the basis of all the world's great movements. And why does every human being worth his salt work hard to secure capital? Because he wants with all the strength of his being that second of the foundations of which I speak, *leisure*. The prime object of spending—and, therefore, of amassing capital, is to secure this leisure. And then the old cycle once more—the leisure so obtained is employed for the gathering of more capital. The third foundation, of which one could speak for hours, though we must content ourselves with only passing reference, is *mobility*—that opposite of physical stagnation, intermittent shocks in the leisure which is the goal of all mankind.

Pithecanthropus, the sub-man, had no leisure at all in the proper sense of the word; it was mere animal relaxation. Physically necessary as a rest from gorging and killing, morally important as being the state from which real leisure developed.

The Neanderthal man could light a fire, and knew how to shape and sharpen flints by knocking them against each other, *in a certain definite manner*. These last five words tell us that gradually there is now growing into the rest periods of primitive man a quality of thought, of reasoning that is transforming part of them into leisure. In the contact of flint with flint sparks were generated; one day these sparks kindled some dry sticks close by. Next day—perhaps some hundreds of years later to be more accurate—these sparks were made on purpose, and the flints were banged together under a pile of brushwood. Fortuitously one day a haunch of the venison tumbled unnoticed into the blaze at the cave-mouth, was pulled out, and tasted ever so much nicer.

On further developments in man's control over matter I do not want to enlarge; what I have mentioned already is intended to emphasise the influence of the development of the physical activities upon the growth of imagination, of contemplation, and of creative thought. Let us proceed with this mental development. Retrospection begins to appear in the lowly mind. The desire for and love of trophies is born; the head-hunter, the scalp-collector, and with the desire for a permanent reminder of prowess the epic is born, history has come into being. Art has arrived to dwell with man; he dances as a physical sign of his happy memories; rhythm, the sire of music, becomes incorporated in his leisure. The tom-tom, the pipes, follow in natural sequence. With a bit of coloured earth he draws the reindeer he slew yesterday; on the walls of the cave he savagely cuts with a sharpened flint the outline of a mammoth that has trampled his wife to death. It is quite conceivable that the pleasure derived from this newly found use of his leisure well outweighs the ephemeral pain of his bereavement. Man has experienced the delights of pictorial art.

So far mankind has hardly tumbled out of his cradle; his thoughts, though now fast developing in complexity, are still concentrated on the concrete. But now he begins to think in a higher plane. "Why," says he, "was I not victorious in that last fight?" "How does the thunder come?" How? and why?—something new in his mentality, something to bring a new and vital interest into his leisure. The abstract confronts him, and imagination becomes an integral part of human development. The first ideas of some omnipotent Deity flash vaguely through his mind, and he theorises—he invents abstract thought. Religion is born with its twin brother, science. And with advent of reasoning, concrete and abstract, we have with us tradition, the ancestor of history. But first came imagination, the sire of all the arts and sciences. In early folk-lore man found both the material and the beauty for the poetry that was later to gladden his soul, for the music that was to revolutionise his leisure hours. Æsthetic love of the sights and sounds around him, of the pictures and songs he slowly learnt to create himself, sweetened the hours that, in his strenuous existence, had to be set aside for rest.

And so man has now solidly established leisure as a definitely purposeful part of his life. His manual labour, his hunting, his housekeeping, his fighting, though still looming large on his horizon, are now definitely, if to him unconsciously, in their proper place as a means to an end, the beauty, the happiness, the social harmony, the intellectual interplay, of human life.

Purposeful leisure, then, we can take it, has now been established as one of the fundamentals of civilised life. No curve of human progress has ever been without humps on its course. Let us hope that, on the whole, the curve continues and will continue to work upwards.

When we follow the history of our own country, tracing the gradual development of democratic control from a practically absolute monarchy, through Magna Carta, the Petition of Right, the Reform Bill of 1832, to the parliamentary rule of the present day, it must strike everybody that, out of leisure, with its protected capital, has been evolved our parliamentary system. In the olden days of despotism there was no real leisure; with the gradual transformation of the peoples' indolence, between bursts of manual labour and fighting, into properly organised leisure, came the equally gradual power of corporate and individual deliberation which bore fruit in self-government. Cabinet responsibility, too, was just as surely of the same growth, and also that essentially democratic system in government, decentralisation, without which the human touch is lost, and democracy gradually drifts back to the tyranny of bureaucracy. The British Empire is the finest example the world has ever seen of successful decentralisation, a decentralisa-

tion which, with all its shortcomings, has brought to man greater happiness and prosperity than any other form of empire control. And all the ramifications of our great system of administration, our King, our Parliament, our self-governing Dominions, our county councils, our borough councils, our literature, art, music, science, all have sprung from a proper appreciation, a proper use, of that great and abiding blessing, leisure.

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Special Articles.

THE VITAMIN CONTENT OF MARGARINE.

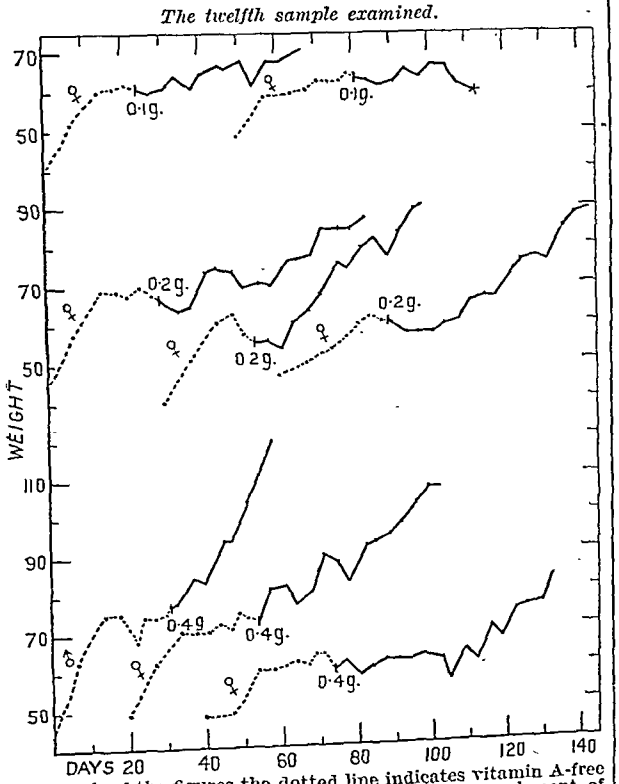
(*a*) VIKING MARGARINE. (*b*) SILVER TRAY MARGARINE. (*c*) WELCOME MARGARINE. (*d*) GOLD CHAIN MARGARINE.

BY KATHARINE H. COWARD, D.SC. LOND.

(*From the Pharmacological Laboratories, Pharmaceutical Society of Great Britain, London.*)

IT has long been recognised that most brands of margarine are inferior in nutritive value to butter because of their lack of the accessory food factors known as vitamins A and D. Recently Planters Foods Limited have been advertising the sale of four brands of margarine in which this deficiency is made good by the process of incorporating a vitamin concentrate during the manufacture. These brands are known as Viking, Silver Tray, Welcome, and Gold Chain, and they differ from one another in the composition of the fats used in the preparation of each brand. The vitamin concentrate added is the same for each, both in nature and in quantity.

FIG. 1.—*Vitamin A Test on Viking Margarine.*
The twelfth sample examined.



In each of the figures the dotted line indicates vitamin A-free diet only, and the continuous line shows the supplement of margarine given daily.

In 1927, when the vitamin-testing department of the Pharmaceutical Society of Great Britain was established, Planters Foods Limited requested the Society to investigate the truth of the claim that these margarines were equivalent in their content of vitamins A and D to the best summer butter, and, further, to be willing to issue a certificate endorsing the claim if the investigation showed that it was justified. On account of the importance to the public of an independent testimony, the Society agreed to do this under certain conditions which were accepted by Planters Foods Limited. The most important of these were: (1) that the samples of margarine

FIG. 2.—*Vitamin A Test on Silver Tray Margarine.*

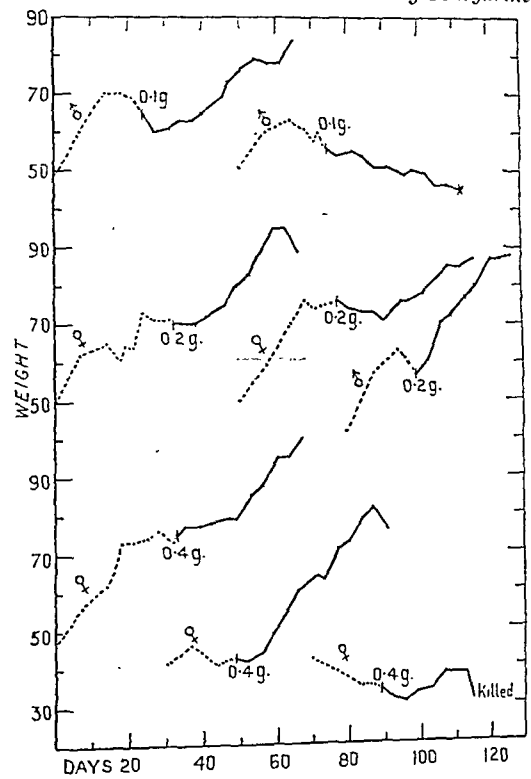
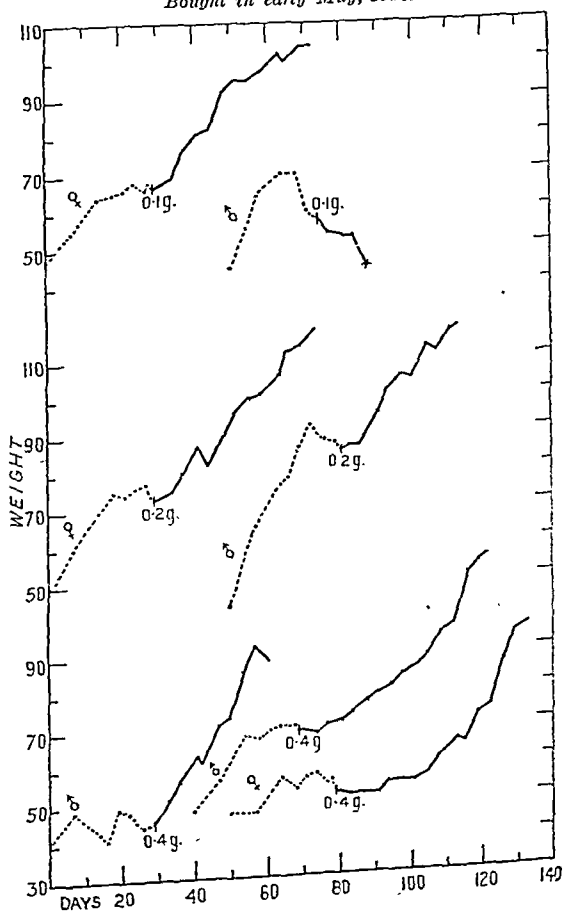
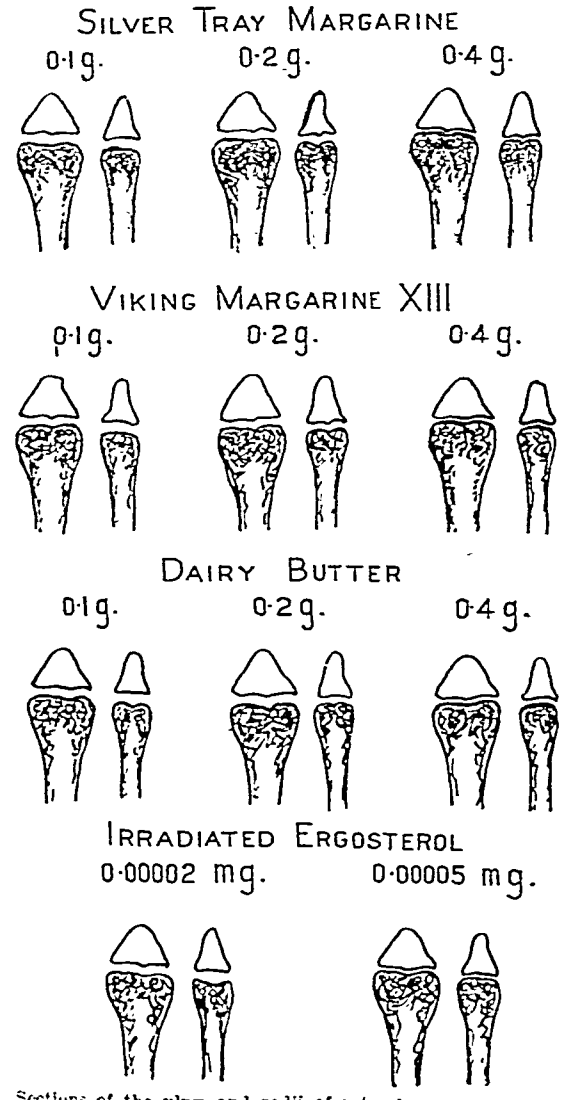


FIG. 3.—*Vitamin A Test on a Sample of Fresh Butter*
Bought in early May, 1928.



amined should be bought by the Society in the dinary retail shops; (2) that before the issue of a rtificate a sufficient series of samples should show uivalence with butter; (3) that the certificate when ued should only be used so long as regular monthly aminations continued to give satisfactory results. During the last 17 months a series of comparisons ive been made between 14 samples of these four

FIG. 4.



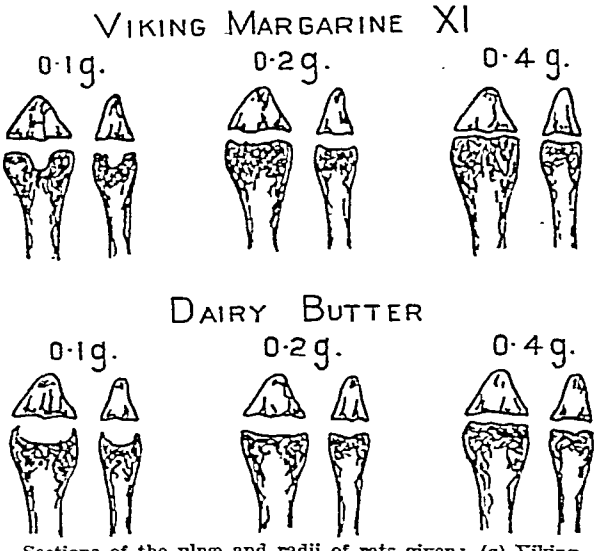
Sections of the ulnæ and radii of rats given: (a) Silver Tray margarine, (b) Viking margarine XIII., (c) dairy butter (May 29th, 1928), or (d) irradiated ergosterol. The highest dose, 0·4 g., of each of the margarines is equivalent to the highest dose, 0·00005 mg., of irradiated ergosterol. The butter was at this time of the year only slightly less potent than the margarine.

brands of margarine and 14 samples of fresh butter bought at the same time.

The tests for vitamins A and D have been carried out by the methods described in the Society's booklet of tests.[1] The assay of vitamin A is based on the response given to small doses of the butter or margarine by animals which have become steady in weight on a diet deficient only in vitamin A. A special feature of the Society's vitamin A free basal diet is that it is rendered completely antirachitic by irradiating it in very thin layers under a mercury-vapour lamp. It is thus assured that cessation of growth is *not* due to a lack of vitamin D, and any response in growth when butter or margarine is given is due to the vitamin A content of the substance under examination.

The assay of vitamin D is based on Steenbock and Black's technique for the "line" test. Rats are rendered rachitic by 3–4 weeks feeding on a diet containing an excessive amount of calcium. Some of them are then given graded doses of the substances, butter and margarine, to be compared, others are given graded doses of the Society's standard preparation of irradiated ergosterol for a period of ten days. On examination of longitudinal sections of the ends of the ulna and radius, stained with silver nitrate and exposed to the light, the amount of calcification can at once be seen and comparisons drawn. The reason for making the comparison with irradiated ergosterol as well as with butter is to obtain a value of the antirachitic potency of the product in absolute units. The Society has defined a unit of antirachitic potency (vitamin D) as that amount of activity

FIG. 5.



Sections of the ulnæ and radii of rats given: (a) Viking margarine XI., or (b) dairy butter (May 8th, 1928).

contained in 0·0001 mg. of its standard preparation. (It is hoped that large quantities of this standard will shortly be available for other workers in this field.)

Results.

The results show, without any doubt, that these margarines are equal to the best summer butter in their vitamin A and D content. Typical results only are shown in the diagrams. The vitamin D test is the only one so far in which a standard preparation is available for assay, and it is to be emphasised that the margarines showed a remarkably constant vitamin D content, a dose of 0·4 g. of each sample examined being equal in antirachitic potency to a dose of 0·00005 mg. of irradiated ergosterol, from which it was deduced that the margarines contained 1·25 units per gramme. The vitamin D content of the butters examined in this work from time to time varied; only in one sample was it found to be as much as 1·25 units, mostly it was 0·75 to 1·0 unit. No sample of butter bought in the open market has been found to have a vitamin D content higher than that of the margarines.

[1] Tests. Pharmacological Laboratories, Pharmaceutical Society. St. Clement's Press. London. 1928.

GLASGOW REFRACTION HOSPITAL.—Sir Matthew Montgomery last week formally opened this institution, which became available to the public on Oct. 1st. It is managed by a committee of qualified opticians and is mainly for examination purposes. No treatment will be given, patients being sent to the eye infirmary or some other ophthalmic institution, but free spectacles will be provided for necessitous persons.

THE LONDON MEDICAL EXHIBITION.

THIS exhibition, the eighteenth, which was open to medical men only, from Oct. 1st to 5th, was the largest that has been held, every available inch of space in the upper and lower halls of the Central Hall, Westminster, being occupied, while the attendance of London and home counties' medical men was larger than usual, as was the number of overseas visitors. The exhibits included medicinal products, surgical, optical, and aural instruments, electrotherapeutical apparatus, orthopædic appliances, X ray outfits and radiographs, ultra-violet rays apparatus, and other exhibits which practically covered the whole of medical and surgical treatment and practice, while room had to be found for a special section for actinotherapy and allied branches. The following is a brief review of the exhibition.

DRUGS AND PHARMACEUTICAL PREPARATIONS.

BURROUGHS WELLCOME AND CO. (Snow Hill-buildings, London, E.C.). The exhibit of this firm attracted considerable attention. Among the wide selection of products shown were "Tabloid" and "Hypoloid" Ephedrine, which is now largely used for the treatment of asthma and hay-fever; and "Wellcome" Liver Extract for pernicious anæmia. Of recent years a series of products issued by Burroughs Wellcome and Co. has been found of the greatest possible value in leprosy. The earliest of these is "Moogrol," a mixture of esters of the acids of the chaulmoogric series. Further investigation has proved that by using the sodium salts of the less irritating, lower melting-point fatty acids of hydnocarpus oil, the best results were obtained, and these have been issued by Burroughs Wellcome and Co. under the brand name "Alepol." "Avenyl," a third anti-leprotic, was exhibited. It is notable that all "Wellcome" serological and related products, a wide selection of which was shown, are British made at the Wellcome Physiological Research Laboratories, Beckenham, Kent.—THE BRITISH ORGANOTHERAPY CO., LTD. (22, Golden-square, London, W.), called special attention to Saccharomycin (B.O.C.), an isothermal, isotonic, and living yeast whose activation is best at body temperature. It is particularly indicated for furunculosis, acne, and other conditions where yeast has been found useful. A large range of glandular preparations was also shown by this company: "Opojex" lymphoid solution for sexual impotentia, severe nervous disorders and degenerative conditions; Evatmine for asthma, spasmodic affections, and chilblains; and liver preparations.—OPPENHEIMER, SON AND CO., LTD. (179, Queen Victoria-street, London, E.C.), made a feature of vitamin preparations, Vitad (vitamins A and D) in particular, which is the purified unsaponifiable fraction of cod-liver oil. Vitad in palatinoid form is portable, easy of administration, and tasteless. Bipalatenoids for exhibiting ferrous salts, and Roboleine which contains animal fats, maltose, diastase, with natural nitrogenous and phosphoric compounds, together with the "A," "B," and "C" vitamins, were also shown.—MAY AND BAKER, LTD. (Battersea, London, S.W. 11), exhibited a very representative selection of their well-known pharmaceutical and new preparations, including Halarsol, a stabilised solution of 3-amino 4-hydroxyphenyldichlorarsine hydrochloride for the treatment of yaws by intramuscular or subcutaneous injection; Parosan, an organic arsenic compound of low toxicity for oral administration in the treatment of disseminated sclerosis; and Neobistovol, for intramuscular and oral use in syphilis and yaws. Attention was also drawn to Arthyrytin (ammonium ortho-iodoxy benzoate), a new remedy for the treatment of chronic arthritis.—H. R. NAPP, LTD. (3 and 4, Clements Inn, Kingsway, London), among a wide selection of pharmaceutical products, showed magnesium "Perhydrol," an odourless and tasteless powder which readily dissolves in dilute acids with the production of H_2O_2 to replace Hydrogen Peroxide for oral administration; Normacol, an intestinal evacuant; Theosol, theobromine calcium salicylate, indicated in hypertonia, arterio-sclerosis, spastic vascular conditions, asthma, angina pectoris, and as a diuretic; Matronax, a complex ovarian sedative compound; and Ephetonin, which replaces adrenalin in bronchial asthma and hypotonia.—HOWARDS AND SONS, LTD. (Ilford, near London). A prominent exhibit of this firm, which is well known for its production of soluble aspirin, was a selection of aspirin tablets in a variety of colours, so as to disguise the nature of the drug when prescribed by the medical practitioner. This firm also drew attention to Agotan Ointment, a new form of treatment for rheumatoid conditions due to excess of uric acid; Hydrogen Peroxide and Standard Ether, which is used in a large number of medical institutions in London and the provinces. Many fine chemicals were also shown.—MENLEY AND JAMES, LTD. (64, Hatton-garden, London, E.C.), drew particular attention to Neuro Phosphates (Eskay Brand), for which the claim is made that it presents the glycerophosphates in a stable, readily assimilable, and palatable form. Although it has only recently been introduced in this country, clinical reports from Canada and the United States have been very favourable. In addition, a wide range of Iodex products were shown, and the Thermolite Lamp, for the application of radiant heat, infra red rays, demonstrated.—W. MARTINDALE (12, New Cavendish-street, London, W.) showed a remarkably wide range of pharmaceutical preparations, including Methyl-Aspriodine containing 39·7 per cent. iodine and the equivalent of 56·3 per cent. aspirin. This is intended to supersede methyl-salicylate (B.P.) for rheumatic affections and as a general local analgesic. Peptone "sterules" for use in bronchial asthma, animal extracts, pituitary, suprarenal, thymus, and so forth were exhibited, as also peptone "Sterules" for use in asthma and in hay-fever, and conditions which exhibit an anaphylactic character or sensation; and sphagnum moss dressings were also made prominent.—SAVORY AND MOORE, LTD. (143, New Bond-street, London), exhibited their Food for Children, with many striking photographs of the benefits obtained from its use; Peptonised Cocoa and Milk, and Peptonised Milk, their advantages being ease of digestion and nourishing qualities; Magnesia Cordial; Bismoid Suppositories for hæmorrhoids; and pharmaceutical preparations in wide variety. Attention was also called to the antiseptic drums of sterilised dressings of John Bell and Croyden, with whom Savory and Moore are now associated.—HEWLETT AND SON (35–42, Charlotte-street, and 83–85, Curtain-road, London, E.C.) presented a large number of original preparations, including Antiseptic Cream for eczema, abrasions, and so forth; and a series of medicated skin lotions that readily evaporate on the skin, Evapogens; Hormonigen, an improved ointment for hæmorroids, both internal and external; and Gargar Formalin Co. (Hewlett's), an efficient and pleasant gargle and mouth wash.—CROOKES' COLLOSOLS LABORATORIES (22, Chenies-street, London)—whose interesting exhibit attracted many visitors by their presentation of a film showing Brownian movement—had among their new features Collosol Metallic Bismuth, which is quickly absorbed, and it is claimed that the danger of toxic symptoms associated with many preparations of bismuth is here avoided. Collosol Mercurochrome, which is readily soluble, was also shown, as well as Collosol Lactomagnesia, containing approximately 10 per cent. of magnesium hydroxide in colloidal form. Besides neutralising acids without the evolution of gas, it is a mild laxative.

THE BRITISH DRUG HOUSES, LTD. (Graham-street, London, N.), among their well-known vitamin products exhibited Radiostol, Radiostoleum, and Radio-Malt, as well as a palatable powder liver extract. A feature was also made of their Aether Puriss, Ephedrine, Caprokol, Pituitary Extract (posterior lobe), and Shadoform, a readily prepared liquid meal for X ray diagnosis.—NUJOL LABORA-

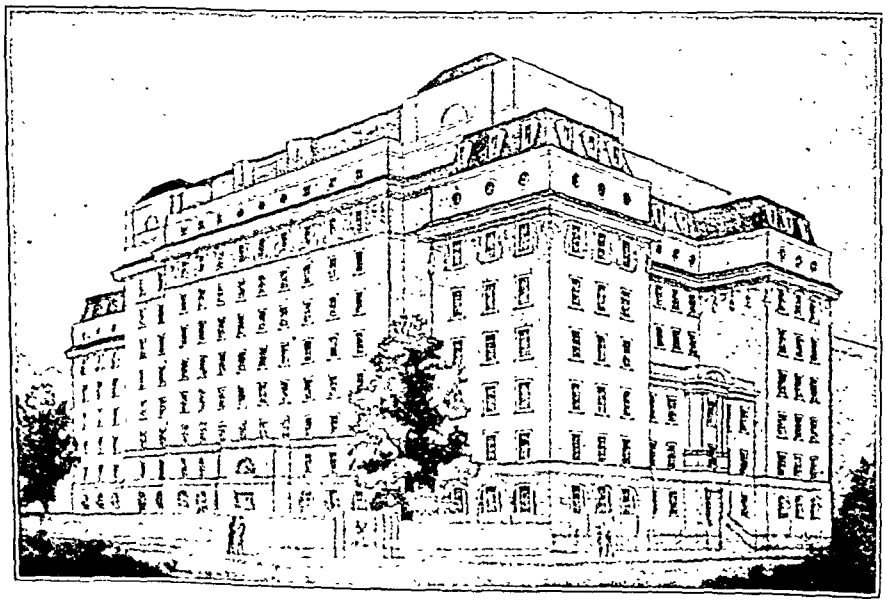
TORIES (Albert-street, Camden Town, London, N.W.). The intestinal lubricant, Nujol, which is manufactured to a rigid standard of viscosity, proved to be correct by exhaustive clinical research, was shown by the representatives of this laboratory, who pointed out that the cost of the preparation has been considerably reduced. Mistol, a combination of Menthol, Camphor, and Eucalyptol, with a pure mineral oil for use in an atomiser or with a dropper for medicating the mucosa of the nose and throat, was also demonstrated.—EVANS, SONS, LESCHER AND WEBB, LTD. (56, Hanover-street, Liverpool; 50, Bartholomew-close, London, and at Runcorn), made a prominent exhibit of Hepatex, a highly concentrated extract of liver which is put up in bottles of 4 oz. containing the equivalent of 64 oz. of fresh liver. It is palatable, and it is not necessary to add it to soups or similar vehicles. Another outstanding exhibit of this firm was Quinine and Urethane solution for the injection treatment of varicose veins, while prominence was given to a vaccine for the common cold, and to Medisoaps, medicated soaps for skin treatment.—G. W. CARNRICK CO. (Brooks and Warburton, Ltd., 40–42, Lexington-street, London) showed Endocrine products in great variety. These are made from the fresh glands of healthy animals, and the standardisation and analysis of the preparations are supervised by expert chemists.—THE BRITISH ALKALOIDS, LTD. (104, Winchester House, London, E.C. 2), again made prominent T.C.P. (Trichlorophenylmethyliodosalicylic acid in H_2O) with powerful germicidal properties, analgesic, antithermic, keroplastic, non-hæmostatic, non-caustic, non-toxic. T.C.P. B^3 Colloidal Emulsion is recommended in cases of intestinal toxæmia and its sequelæ. Ferro Vitamines, Yeast dried at low temperature in vacuum containing all the water soluble vitamins combined with the polyhalogen: Ferrobromoacetyliodosalicylate, also attracted considerable attention.—THE SANDOZ CHEMICAL WORKS (5, Wigmore-street, London) made a special feature of Sandoptal (Isobutyl-allyl-barbituric acid). This new hypnotic is of low toxicity and non-irritant, while it is claimed to be free from dangerous subsidiary actions. Among other products shown by this firm were Femergin (ergotamine tartrate), the pure active specific alkaloid of ergot of rye; Lobeline for the relief of grave respiratory troubles of central origin; and Bellafoline, the total natural alkaloids of atropa belladonna.—DESHELL LABORATORIES, LTD. (Braydon-road, London, N. 16), drew attention to the emulsion of medicinal paraffin and agar-agar, known as Petrolagar, for the treatment of intestinal disorders, which is supplied in four forms—namely, plain, phenolpthalein, alkaline, and unsweetened.

(*To be continued.*)

A NEW NURSING HOME AND CLINIC FOR LONDON.

CONSIDERABLE interest was excited in the Harley-street area by the appearance on the morning of Thursday, Sept. 20th, of a large board at the corner of Devonshire-place and Marylebone-road, announcing the proposed erection of the London Clinic and Nursing Home (see Fig. 1) on the site immediately east of the board. The area to be covered (approximately 40,000 feet super.) is shown below (Fig. 2). The property will be held on a lease from the Lord Howard de Walden Estate for a term of 99 years, computed from July 6th, 1926, at a ground rent of £2250, the rent from July 6th, 1926, to July 6th, 1927, being £750, and from July 6th, 1927, to July 6th, 1928, £1500. We have made inquiries into the purpose and scope of the institution, the building of which will cost £300,000, and learn that it is being established as a nursing home with 175 beds for paying patients. Moreover, the group of consultants, representing various branches of medicine and surgery, who originated the scheme have expressed their willingness to rent consulting rooms at the clinic if they are provided with these rooms and other amenities under one roof. They will act in consultation with a patient's own medical man, and if necessary with one another. In the nursing home there will be suites of rooms with every luxury to meet the wishes of the wealthy classes, and also rooms where the total charges made will be based on a scale suitable to patients with moderate means. It is hoped that it will be found possible to take some deserving cases at less than cost. The fees quoted for accommodation in the nursing home will so far as possible be inclusive. Space has been provided for radium, X ray, deep X ray, hydro- and actinotherapy, and for bacteriological, pathological, and biochemical laboratories. Two medical officers will reside on the premises. The following medical consultants will act as an honorary advisory committee: Dr. H. Moreland McCrea (chairman), Sir G. Lenthal Cheatle (vice-chairman), Dr. A. P. Beddard, Mr. W. R. Bristow, Mr. H. D. Gillies, Mr. W. G. Howarth, Mr. H. Tyrrell Gray, Prof. J. W. H. Eyre, Dr. Bertram Shires, Mr. A. H. Levy, and Mr. A. Pallant.

FIG. 1.

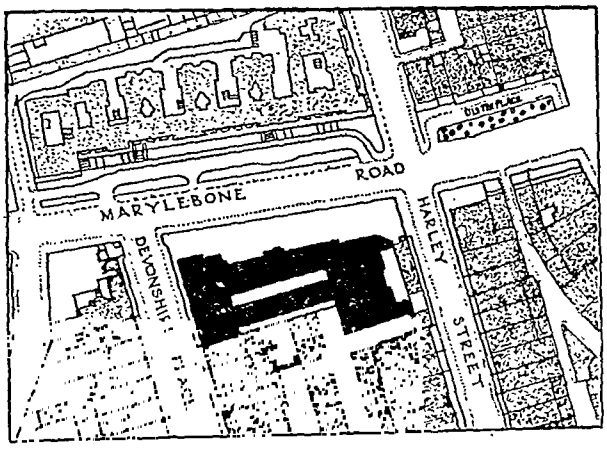


The London Clinic and Nursing Home as it will appear

It is hoped that eventually it will be possible to devote a proportion of the profits to the provision of facilities for research. In the proposed memorandum

of association Section (6) reads: To provide facilities for the study and prevention of disease and to promote information on medical subjects by lectures, discussions, books, correspondence with public bodies and individuals or otherwise, and also to encourage the study and prevention of disease, and for that purpose to make donations on such terms and conditions as may from time to time be prescribed of a prize or prizes or other rewards or distinctions.

FIG. 2.



Map of neighbourhood showing position of the new building.

The Financial Side.

The company has a capital of £250,000, which is to be subscribed privately.

From the figures set out in the prospectus, which have been based on an 85 per cent. occupancy, we gather that the estimated revenue from all sources is £118,700, and the estimated annual expenditure £85,000. This would leave a net income of £33,700 which would be subject to income-tax and would be available for dividends on the £117,500 preference shares (7 per cent.) now to be issued, and then for distribution of dividends on the ordinary share capital of £125,000, and for contributions to research and to a reserve fund. An insurance scheme has been arranged for the completion of the purchase of the building; after the expiration of 25 years a sum of £15,300, comprising the annual interest and premium charge, will be added to the profits, which, according to the estimates, would then represent approximately 41 per cent. of the revenue.

Shareholders in the company will be provided with forms of recommendation in proportion to their holdings. Other considerations being equal, patients so recommended will as far as possible be given priority of admission.

It is not stated what fees it is proposed to charge for beds, and whether medical and specialist services are to be included or to be arranged separately. Many other questions will suggest themselves to our readers and will doubtless be answered shortly by a more detailed account of the scheme than is available in the prospectus submitted to us.

MANCHESTER ROYAL INFIRMARY.—The governors of the East Lancashire Homes for Disabled Sailors and Soldiers have resolved to hand over Grangethorpe Hospital as a free gift to the Manchester Royal Infirmary on condition that the institution remains an orthopædic hospital for the treatment of ex-Service men referred there by the Ministry of Pensions. The chairman of the infirmary has accepted the gift on behalf of the board of management. Grangethorpe cost £11,000 in 1918, and it is stated that since that date the Government have spent sums amounting to £100,000 on the erection of wards and reception huts in the extensive grounds for the patients. The date on which the Ministry of Pensions will relinquish control is not yet fixed.

Correspondence.

"Audi alteram partem."

INSOLATION AND PULMONARY TUBERCLE.

To the Editor of THE LANCET.

SIR,—From the letters of "M.R.C.S." and Dr. F. R. Walters on "insolation" in pulmonary tuberculosis (THE LANCET, Sept. 15th, p. 580; 22nd, p. 630), it is not quite clear what they actually mean by this term. If "insolation" means exposure to hot summer sunshine in ordinary clothing for any length of time, such as the usual sanatorium midday rest hour, I am in complete agreement with them about its dangers. When a patient has an unexpected evening temperature in the summer time, it has long been my custom to ask if he has been sitting in the sun for any unusual time. My own pulmonary patients are not allowed to be in the sun for their rest hour, unless actually carrying out heliotherapy.

It would appear, however, that some confusion exists between the effect of "insolation," as defined above, and the effect of properly conducted heliotherapy. The one is undoubtedly often harmful, the other has proved in my own hands of undoubted benefit. In those cases in which fever can be controlled by rest, heliotherapy can generally be employed without any of the ill-effects usually ascribed to it. The one great precaution, as with any treatment, is adequate control. The explanation of this apparent contradiction in the effect of sunshine is probably that in the one case the body is grossly overheated, exposure being followed by depression and even reactivation of disease; in the other the body is kept from overheating by the cool circulating air (or preferably wind), exposure producing a sense of well-being apparently followed by increased resistance.

Whilst heliotherapy is little used in other sanatoria for pulmonary tuberculosis in this country, the use of powerful carbon arcs in small ill-ventilated and over-heated rooms is fairly common, a method of treatment perilously akin to "insolation." I should like to take this opportunity of emphasising the importance, when administering any form of light treatment to pulmonary cases, of proper pulse and temperature records, before and after exposure, and of avoiding sweating. When carefully administered and controlled, I believe that both natural and artificial light play an important part in the treatment of pulmonary tuberculosis.

I am, Sir, yours faithfully,

J. E. WOOD,

Medical Superintendent, King George's Sanatorium for Sailors, Liphook, Hants.

Sept. 26th, 1928.

SUPRARENAL APOPLEXY.

To the Editor of THE LANCET.

SIR,—In your annotation last week on a paper by F. Pearl and H. Brunn it is stated that "any combination of symptoms may form the clinical picture, but asthenia is the most constant and characteristic of all symptoms." The subject is discussed fully in my recent book, "Fever, Heat Regulation, Climate, and the Thyroid Adrenal Apparatus," where it is shown, with references to the literature, that the condition is frequently associated with a sudden pyrexia. The condition then simulates an acute infection in its symptoms, and if the patient dies in that condition it has frequently been wrongly diagnosed as such—e.g., purpuric small-pox, scarlatina. Sometimes the fever may subside, to be followed by a subnormal temperature and asthenia, or the asthenia may be the first symptom which has been noticed.

I am, Sir, yours faithfully,

W. CRAMER.

London, Sept. 28th, 1928.

THE BERLIN FOOD EXHIBITION.

To the Editor of THE LANCET.

SIR,—Some impressions gathered during the closing days of this exhibition may be of general interest. It was in truth a great exhibition. According to the *Berliner Tageblatt* upwards of three million visitors passed the turnstiles during the comparatively brief period of 100 days for which it was open. The success, comments that journal, is the more remarkable, seeing that the educational character was maintained throughout and no pleasure features were included. The nearest approach I saw to an exception to this rule was an enormous pig, two years old and weighing 305 kilos, and a sow of the same age, but 45 kilos heavier. The former slept all day, refusing to be aroused by my companion's missiles. The expenses of the scientific section were heavy. It has, however, fulfilled its mission of enlightening the public—witness the reports appearing in home and foreign journals, and the enthusiastic testimony of representatives of hundreds of organisations of all kinds.

By the courtesy of the authorities, and of Herr Redakteur Teich-Balgheim in particular, the invaluable services of Dr. Munchhauser, the head of the scientific section, were placed at my disposal. In him I had an expert guide of great experience, for it was he who organised the Düsseldorf Exhibition of a few years ago. When recalled to his post his place was taken by Dr. Ohler. It was likewise my good fortune to meet Dr. Max Winckel, the editor of the *Volks-Ernährung*, with whom, I understand, the idea of the exhibition originated, and through whose exertions the municipality of Berlin, in common with the German and Prussian Government departments concerned, was induced to participate.

The scientific section consisted in large measure of exhibits lent by the German Hygiene Museum at Dresden, which was formed as an outcome of the famous exhibition held in that city in 1911. To visit it, Prof. Irving Fisher, of Yale University, U.S.A., whose standing as an authority upon all questions relating to health (he was a member of the Commission on the Conservation of National Resources appointed by President Roosevelt, besides being adviser to the Life Insurance Company, of New York, and other bodies) is well-nigh as high as on his own subject of economics, made a special journey across the Atlantic. Moreover, on his arrival in this country, after a week's stay in the Saxon capital, he assured me that he had been amply rewarded. The most important exhibits were in the section entitled Der Mensch und seine Ernährung, which achieved much educational work. During June the exhibition was visited by enormous numbers of school-children, while, as its last few days witnessed the reassembling of the schools, numerous classes, headed by their teachers, were encountered in the course of my peregrinations. Guides in the same section, obtainable for a modest fee, lectured on the exhibits to large and evidently keenly interested audiences. Home truths were apparently included in the informal talks, for one guide was overheard telling his hearers that "Germans take much more meat than the French and less vegetables." Scientific addresses were given by Dr. Winckel to some 3000 teachers of household economy. Special visits were also arranged. Thus, on the day of my first visit, the hotel proprietors and chefs of the city had been invited, to whom Dr. Winckel spoke on Uncooked Food, its Value and Use.

With a solicitude that other promoters of exhibitions would do well to emulate, comfortable straw chairs were placed in clumps throughout the scientific section, so that single exhibits might be studied, and the delicate or weary rest. The four halls were so vast that though the average attendance on each of the last week days was 30,000—the official figure for the final Sunday but one was 50,000—no undue crowding or inconvenience was experienced. Visitors included all sorts and conditions of people. There were, of course, great numbers of housewives, usually accompanied by their men folk, and young couples by the score. For both these categories the exhibition will often doubless mark the opening of a new era, in their knowledge of all that appertains to health in its broadest sense. Then there were Red Cross and other nurses, as well as a group of peasants with quaint head-dresses reminiscent of Brittany. The crowd was well dressed and singularly orderly. I did not remark a single individual the worse for liquor. The cloak-rooms—a weak spot in so many exhibitions, as I can testify from large experience—were numerous and cleanly, while the restaurants were not merely, as might have been expected, far above the average in the quality and variety of the fare provided, but so numerous and conveniently placed that a visit seldom entailed delay.—I am, Sir, yours faithfully,

CHARLES E. HECHT, M.A.,
Hon. Sec., Food Education Society.

29, Gordon-square, London, W.C., Sept. 29th, 1928.

Medical News.

UNIVERSITY OF MANCHESTER.—At recent examinations the following candidates were successful:—

DIPLOMA IN PUBLIC HEALTH.

Part I.—Martin Naughton and Josephine Walmsley.

Part II.—Georgie I. Brodie, T. S. Hanlin, Harold Harrison, Martin Naughton, Jean M. Orkney, J. S. Smith, and Margaret Sproul.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.

Part I.—H. A. Palmer.

UNIVERSITY OF LONDON.—The Semon Lecture, entitled Laryngo-Rhinology and General Medicine, will be given by Prof. Markusz Hajek, professor of oto-rhino-laryngology in the University of Vienna, in the Barnes Hall of the Royal Society of Medicine on Thursday, Nov. 1st, at 5 P.M.

As we have already announced, a course of three lectures on Smoke Pollution of the Air and Public Health will be given by Dr. John S. Owens, at University College, on Nov. 2nd, 9th, and 14th, at 5.30 P.M.

At 5.30 P.M. on Wednesday, Nov. 7th, a lecture on the Human Factor will be given at University College by Mr. F. A. P. Aveling, Ph.D., reader in psychology in the University; and at the same hour on Nov. 14th Dr. R. J. S. McDowall, professor of physiology in the University, will speak on Physiology and National Efficiency. These lectures form part of a series on the Indebtedness of Industry to Pure Science.

A course of six lectures on Urinary Secretion will be given by Dr. E. B. Verney, professor of pharmacology in the university, at University College, at 5 P.M., on Mondays, Oct. 15th, 22nd, and 29th, and Nov. 5th, 12th, and 19th.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.—The annual Neech Prize for the best paper read before a branch or group of the society has been awarded for 1926–27 to Dr. J. A. H. Brincker for his communication on the Case for Diphtheria Immunisation, delivered to the metropolitan branch of the society.

RADIUM CENTRE OF THE METROPOLITAN ASYLUMS BOARD.—A new centre for the treatment of uterine cancer by radium at the North-Western Hospital, Hampstead, will be in the charge of Mr. Comyns Berkeley. The method generally to be followed will be that developed at the Radiumhemmet in Stockholm by E. J. Heyman. The Metropolitan Asylums Board will be responsible for transport of patients to and from the centre, either from the poor-law institution or from the patient's home. Patients suffering from cancer either of the cervix or of the body of the uterus will be accepted. General anæsthesia of short duration is induced for each of the insertions of radium. The Metropolitan Asylums Board is prepared on the advice of the medical director of the centre to accept patients believed to be suffering from cancer of the uterus on clinical diagnosis only. In such cases it is particularly desirable that there should be no disturbance of the growth for the purpose of diagnosis either by curettage or removal of tissue. Radium treatment only will be undertaken at the centre, and the Board may refuse treatment to any patient considered unsuitable by the medical director. Periodical reports on the work of the centre will be published.

MEDICAL OFFICERS OF SCHOOLS ASSOCIATION.—A meeting will be held at 11, Chandos-street, Cavendish-square, London, W. 1, on Oct. 19th, at 5 P.M., when Surg.-Commander S. F. Dudley will read a paper on Microbic Dissemination in Schools.

ELIZABETH GARRETT ANDERSON HOSPITAL: *Post-graduate Classes.*—Instruction in clinical pathology, bacteriology, and biochemistry may be obtained in the pathological department of this hospital by medical women during October and November. Particulars of the hours and fees may be had from the secretary.

CHILD-STUDY SOCIETY.—The programme for the session has now been issued. At the Royal Sanitary Institute, 90, Buckingham Palace-road, London, S.W., at 6 P.M. on Oct. 11th, Dr. Letitia Fairfield will speak on Child Study in America. On Oct. 25th, at the same time, Dr. C. J. Thomas will discuss Child Study and the Health of the Child; and on Nov. 8th Mr. Percy C. Buck, Music and the Child-Mind.

HUNTERIAN SOCIETY OF LONDON.—The next session will open on Oct. 15th, when Dr. A. Westerman will deliver his presidential address on Gleanings from the Minutes (1907–1928) at 7.30 P.M. At the meeting on Nov. 5th the subject of discussion will be the Doctor on the Stage, to be opened by Dr. Harold Dearden, Dame Madge Kendall, Sir StClair Thomson, Miss Lena Ashwell, and Mr. Ivor Back. On Dec. 3rd a discussion on the Artificial Termination of Pregnancy will be opened by Mr. C. S. Lane-Roberts and Mr. A. McAlister. On Jan. 14th, 1929, the lecturer will be Prof. Putti, of Bologna. On March 4th the Hunterian Oration will be delivered by Prof. A. W. Sheen on Some Aspects of the Surgery of the Spleen. On March 25th a discussion on Blood Pressure in Health and Disease will be opened by Dr. Halls Dally, Dr. Edgar Obermer, and Dr. Temple Grey.

ST. BARTHOLOMEW'S HOSPITAL.—The session was opened by a gathering of old students, who dined together in the Great Hall. Sir D'Arcy Power, consulting surgeon to the hospital, who was in the chair, said that though there was no formal toast list he was expected to give a short account of events since they last met. Sir William Church and Sir Dyce Duckworth, two of the consulting physicians, had died full of years and honours. Both were typical products of the hospital—cultured gentlemen, known, respected, and trusted throughout England not only by their professional colleagues, but by all with whom they were brought in contact. Mr. Douglas Harmer had resigned his charge of the throat department, an office he had held for upwards of 25 years. Bart.'s men wished him long life and health to carry out some of the many problems in his branch of surgery which still await solution. During the year an active part had been taken by the hospital and medical school in celebrating the 300th anniversary of the publication of "De Motu Cordis," written by Dr. William Harvey, a former physician to the hospital. Foreign delegates bidden to luncheon in that Hall came in their hosts. Many of them, said Sir D'Arcy, confessed to him afterwards that what they suffered from the unaccustomed food was more than recompensed by the surroundings and by Sir Wilmot Herringham's oration. The occasion was further improved by the publication of the first English version of Harvey's immortal work, under the editorship of Mr. Geoffrey Keynes. Building, he said, had gone on as usual throughout the year. The nurses were now properly housed, and the Isla Stewart recreation room, nearly finished, would be a worthy memorial to a great matron. The new surgical block was rising steadily and it would be easy to think, when watching it, that the hospital was being improved out of all knowledge. It was no so, for as far back as records went there was proof of continuous changes in the buildings. At no time had there been any finality; successive treasurers and governors had always seen to it that the hospital should be a little in advance of the times, especially in providing for the sick poor of London. The present building had, alas, diminished his respect for the truthfulness of Rahere, Prior and builder of the church and hospital more than 800 years ago. When Rahere begged the land from King Henry I. he said it was a marsh with water abounding everywhere and the gallows occupied what little dry land there was. "Go and look at the ground dug out for the foundation of the new block," said Sir D'Arcy. "It is a beautiful dry sand with abundant gravel—and Rahere knew it, for he built his church without deep foundations and without piles, where it stands unmoved to this day. Like the buyer of old, he said to the King, it is nought, it is nought, and then went his way and boasted." Finally the year had been memorable in athletics because after many hard fights the inter-hospital football cup had returned to the keeping of the medical school, for the fourth time, but after a long interval.

WESTMINSTER HOSPITAL.—The annual dinner of this hospital was held at Gatti's Restaurant, Strand, on Oct. 1st, when Sir James Purves-Stewart took the chair. After the loyal toast Lieut.-Colonel H. C. Bulkeley proposed "The School," and the Dean, Dr. A. S. Woodwark, replied. He said that numerically the position of the school was admirable; examination results had also been satisfactory, and during the last two years over 60 students had qualified. A sign of great promise was the growing interest of the school in social activities and athletics; a Rugby team was to be restarted this season. The pioneer activities of the hospital with radium had drawn to it the attention of workers in all parts, and the staff of the Carlill Research Laboratories had performed important work. The chairman, in proposing the Health of Past and Present Students, said that the hospital would stand or fall by the qualities of the junior members of the staff and of the young graduates who went out from it year by year. Dr. H. H. Mills praised famous men and women of the hospital's past, and pleaded for the solution of the maternal morbidity problem by team-work. Mr. C. G. Roberts, for the present students, pitied his friends who had gone to hospitals which did not pay such close attention as did the Westminster to turning out finished, practical doctors. Proposing The Guests, Mr. Arthur Evans appealed for funds to acquire adjacent land on which to build accommodation for paying patients. The project, he argued, should appeal strongly to insurance companies, who would benefit greatly if the expectation of life among the middle classes were increased. Mr. Arnold Powell, headmaster of Epsom College, replied, and Dr. Arnold Stott gave the toast of The Chairman.

MIDDLESEX HOSPITAL DINNER.—On Tuesday evening Prince Arthur of Connaught presided over the annual dinner at the Savoy Hotel. In proposing the toast of the Hospital and Medical School he spoke of the courage with which the reconstruction of the buildings had been faced, so that a seeming disaster had served as an incentive to fresh endeavour. There had been not only reconstruction but also development. The building of the new west wing was nearing completion, the central boiler-house was ready to satisfy all branches of the hospital's services, the Courtauld Institute of Biochemistry was humming like a hive of bees, and the first section of the new nurses' home would be open within 12 months. The scheme of development contained one particular feature, however, which had hitherto not been realised. This was the provision of a block for paying patients, and the financial outlook for this had been gloomy. He was proud to be able to say that a friend of the hospital, Lord Woolavington, had come forward with a gift of £125,000 for this purpose, which would ensure that the new Middlesex Hospital would be new not only in fabric and equipment but would also include in its service those who had so far been shut out from its benefits. Responding for the hospital Mr. S. A. Courtauld said that he felt that the future of the reconstruction scheme was now assured. He regarded the great national hospitals as missionaries as well as guardians of the nation's health. Mr. Eric Pearce Gould, who replied, as dean of the medical school, began by saying that no hospital could now be considered complete that did not make some provision for paying patients. He then went on to speak of the retirement of Mr. John Murray from the surgical staff, referring to the value to the school of his assiduous teaching of surgery. He hoped that in his retirement Mr. Murray would not be haunted by visions of students in plus fours, smoking cigarettes, scattering tobacco ash on his billiard table, and chattering of T.B. and acute abdomens. In conclusion, after a passing reference to genius as "10 per cent. inspiration and 90 per cent. perspiration," Mr. Pearce Gould accorded a warm welcome to Mr. R. Vaughan Hudson as a new member of the staff and spoke in modest terms of his own retirement from the post of dean. The last response to the toast was given by Dr. G. H. Dobney, as Broderip Scholar, after which Dr. H. MacCormac proposed the Guests. In the course of his reply Surgeon Vice-Admiral Gaskell, Medical Director-General of the Navy, said that the hospital seemed to have become a magnet for gold, and congratulated the Medical School on having sent some very fine officers into the Navy. Dr. Ainley Walker, dean of the Faculty of Medicine of the University of Oxford, said that he was often asked which was the best hospital in London. His hearers all knew perfectly well which was the best hospital in London, but the question always placed him in a difficult position as he had perfectly frank and unbiased statements from the dean of nearly every medical school to the effect that his was the best and that it was particularly suited to the temperament of senior students from the older universities, either because it was so large, so moderate in size, or so small. The final toast, The Chairman, was proposed by Mr. R. L. Hunter and was drunk with musical honours, after which Prince Arthur wittily replied, assuring those present that he really did think he was beginning to feel healthier already.

LONDON HOSPITAL MEDICAL COLLEGE. — The Schorstein Memorial Lecture, on Expectoration, will be delivered by Dr. Cecil Wall on Nov. 2nd, at 4.15 P.M., in the Bearsted Clinical Theatre.

ROYAL DENTAL HOSPITAL.—The medical committee will be at home to past and present students of the hospital on Oct. 20th from 10 A.M. to 5 P.M. Medical practitioners also are invited to attend. In the morning the various departments of the hospital and school will be open, and demonstrations will be given by members of the staff. In the afternoon orthodontic and other cases of special interest from the clinic of the hospital will be shown.

INTERNATIONAL SOCIETY OF MEDICAL HYDROLOGY. As we have already announced, this Society is holding its annual meeting in England, from Oct. 9th to 17th, under the presidency of Lord Dawson. The proceedings will begin with a reception at the Royal Society of Medicine on the evening of Tuesday the 9th, and on Wednesday morning, at 10 A.M., the members will meet at the Jehanghir Hall of the University of London, South Kensington, where they will be officially welcomed by Sir Gregory Foster as Vice-Chancellor, by Dr. Alison Glover on behalf of the Ministry of Health, and by Sir Holburt Waring for the Faculty of Medicine. The subsequent discussion will be devoted to the State, the Health Resort, and National Health Insurance, and on the next day there will be a meeting at 5 P.M. at the rooms of the Linnean Society in Burlington House, to consider the Humoral Factor in Disease. After this the party will go to Harrogate and Buxton, where the principal subjects under consideration will be the Treatment of Children by Waters and Baths, and Rheumatism as a National Problem. All members of the medical profession are invited to attend the meetings, further particulars of which will be found in our Medical Diary.

THE LATE DR. JULIUS MOORE.—Dr. Moore, who died at his home at Enfield on Sept. 25th after a short illness, was in his fifty-sixth year. Born at Rochester, Kent, he received his medical education at Guy's Hospital, taking the conjoint diploma and M.B. Lond. in 1897, and the M.D. Lond. in 1901. After practising for a short time at Farnborough, Hants, he entered into partnership at Enfield, where he held appointments as surgeon to Y Division Metropolitan Police, to the Post Office, and to the Metropolitan Water Board. In spite of the urgent claims of a large general practice he found time in recent years to take up ear, nose, and throat work, and he devoted much time to the Enfield War Memorial Hospital, of which he became medical manager. Dr. Moore's early death is ascribed to his devotion to his patients, and the attendance at the funeral service at St. Mary's, Enfield, bore witness to the affection felt towards him by his professional colleagues and all classes of the community. He leaves a widow but no children.

MEDICAL DEFENCE UNION.—The annual general meeting was held at the Norfolk and Norwich Hospital on Sept. 29th, Sir Herbert Waterhouse presiding. In proposing the adoption of the report, Sir Herbert said that during the past year the Union had had to defend an unusually large number of High Court actions, and had only lost one case. Fractures of the neck of the femur had given the greatest anxiety; these cases alone had cost the Union over £1400. Claims were nearly always based on alleged negligence in that an X ray examination was not advised, and unless the Union was in a position to prove that such advice had been given, defence became difficult or impossible. Allegations of negligence did not arise as a rule until the doctor's account was sent in; careful notes of the condition when the patient was first seen and of the progress from day to day were of primary importance. The membership of the Union had increased, said Sir Herbert, from 12,916 in 1925, when he became president, to its present figure of 15,474. Available funds had increased during the same period from £36,723 to £57,810. The policy had been for some years to build up a substantial reserve fund, so as to be in a position, if necessary, to carry a case to the House of Lords, and investments now amounted to £35,000. Women doctors were joining the Union in increasing numbers; at present there were about 1400 women members. They were liable to much the same attacks as men; cases of alleged negligence, malpraxis, libel, and slander had been dealt with. Women acting as assistants had been unfairly treated, and women had been wrongfully dismissed from appointments. In one case a woman doctor had been accused of immoral conduct, and a complete withdrawal of the monstrous allegation was obtained. Many newly registered women doctors, said Sir Herbert, had impressed the Union as being curiously ill-informed on partnership agreements, the purchase of practices, and such matters. He strongly urged them before taking any appointment, partnership, or practice, to avail themselves of the help of the general secretary of the Union, who was ready to advise on all matters connected with medical practice. The report of the Council and the financial statement for the year 1927 were adopted unanimously. Dr. W. S. A. Griffith, Dr. V. A. Jaynes, and Mr. F. C. Larkin, the retiring members of Council, were re-elected.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, Oct. 8th.—5 P.M., WAR. Presidential Address: Lieut.-General Sir Matthew Fell: The War Section.

TUESDAY.—5 P.M., THERAPEUTICS. Presidential Address: Prof. J. A. Gunn: Cardiac Stimulants. Members of the Section are invited to take part in the subsequent discussion.

THURSDAY.—8.30 P.M., NEUROLOGY. Presidential Address: Mr. Donald Armour: Some Considerations on Head Injuries.

FRIDAY.—5.30 P.M., CLINICAL. (Cases at 5 P.M.) *Cases:* Dr. C. Worster-Drought: (1) Case of Acromegaly with Progressive Muscular Atrophy. Mr. H. C. Edwards: (2) Case of Syphilitic Disease of the Radius. Dr. C. F. T. East: (3) A Case of Obscure Anæmia. (4) Case of Tricuspid Regurgitation and Pulsating Liver. Dr. J. H. Easton: (5) Case of Traumatic Cyst of Face. (6) Case of Multiple Exostoses. Dr. R. Cove-Smith: (7) Case of Myelocytic Leukæmia. Mr. Cecil P. G. Wakeley: (8) Case of Bilateral Pseudo-coxalgia. Dr. I. M. Allen: (9) Case of Meningioma of Sensory Cortex (after removal). Dr. W. Salisbury Sharpe: (10) Case of Goundou occurring in London. 8.30 P.M., OPHTHALMOLOGY. (Cases at 8 P.M.) Presidential Address: Mr. Cyril H. Walker: Some Recent Changes in the Incidence of Ophthalmic Diseases. *Paper:* Mr. E. Wolff: Report on a Case of a Large Implantation Cyst of the Conjunctiva, with Illustrations and Pathological Report.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W.

MONDAY, Oct. 8th.—8. P.M., Annual General Meeting. 8.30 P.M., Dr. J. W. Carr: Presidential Address, Medical Ambitions and Ideals.

INTERNATIONAL SOCIETY OF MEDICAL HYDROLOGY.

WEDNESDAY, Oct. 10th.—At the University of London (Jehanghir Hall), 10 A.M.: Discussion, The State, the Health Resort and National Health Insurance. Lord Dawson in the chair.

THURSDAY.—At the Rooms of the Linnean Society (Burlington House), 5 P.M.: Discussion, The Humoral Factor in Disease: neo-Hippocratism.

SATURDAY.—At Harrogate: Discussion, The Treatment of Children by Waters and Baths.

BIOCHEMICAL SOCIETY.

SATURDAY, Oct. 6th.—2.30 P.M. (in the Biochemical Laboratory, Cambridge), Sir F. G. Hopkins: The Centenary of Friedrich Wöhler's Synthesis of Urea. *Communications:* A. V. Szent György (introduced by F. G. Hopkins): Functions of Peroxidase Systems, and Chemistry of the Adrenal Cortex. E. H. Lepper and C. J. Martin: A Thermostable Autoxidisable System Comprised of Boiled Muscle and Hæmochromogen. B. Woolf: The Estimation of Ammonia, Urea, and Total Nitrogen. F. Temple Grey: The Behaviour of Glucose in Urine. T. A. Webster and R. B. Bourdillon: Observations on the Irradiation of Ergosterol. A. S. Parkes and G. F. Marrian: Observations on the Distribution of Oestrin. H. D. Kay and P. G. Marshall: The Second Protein (livetin) of Egg-Yolk. E. Stedman: The Miotic Activity of the Urethanes Derived from the Isomeric Hydroxybenzyldimethylamines. H. J. Holman and S. B. Schryver: The Separation of the Basic Products of the Hydrolysis of Proteins. L. J. Harris: The Zwitterion Constitution of the Amino-acid Molecule. Titration Curves of Methylene Derivatives.

SOCIETY FOR THE STUDY OF INEBRIETY.

TUESDAY, Oct. 9th.—4 P.M.: in the Rooms of The Medical Society of London, 11, Chandos-street, Cavendish-square, London, W. Dr. Hubert J. Norman will open a Discussion on Alcohol and Drug Addiction in Relation to Mental Disorders.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.

MONDAY, Oct. 8th, to SATURDAY, Oct. 13th.—BETHLEM ROYAL HOSPITAL, St. George's Fields, Lambeth, S.E. Tues. and Sat. at 11 A.M.: Lecture-demonstration on Psychological Medicine.—CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C. Intensive course—three weeks' duration.—CHELSEA HOSPITAL FOR WOMEN, Arthur-street, S.W. Special Course in Gynæcology.—LONDON SCHOOL OF TROPICAL MEDICINE, Endsleigh-gardens, W.C. Tues. and Thurs. at 2 P.M.: Lecture-demonstrations.—ROYAL FREE

HOSPITAL, Gray's Inn-road, W.C. Wed.: Lecture-demonstration by Dr. Heald.—ROYAL WATERLOO HOSPITAL, Waterloo-road, S.E. Tues. at 2.30 P.M.: Dr. Gerald Slot (Rheumatism).—WELLCOME MUSEUM OF MEDICAL SCIENCE, 33, Gordon-street, W.C. Wed. at 4 P.M.: Demonstration by Dr. S. H. Daukes: A Synoptical Museum of Medicine—Its Value for Post-graduate Study. Further information from the Secretary.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, Oct. 8th.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Simmonds: Surgical Out-patients.

TUESDAY.—11 A.M., Mr. Endean: Venereal Diseases (Demonstration). 2 P.M., Dr. Shaw: Medical Out-patients. 4.30 P.M. (Special Lecture) Dr. Scott Pinchin: Difficulties in Diagnosis of Pulmonary Tuberculosis.

WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. 2 P.M., Mr. Tyrrell Gray: Operations. 2.30 P.M., Mr. Donald Armour: Surgical Wards.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 2 P.M., Dr. Ironside: Medical Out-patients. 2 P.M., Mr. Bishop Harman: Eye Department. 4.30 P.M. (Special Lecture): Mr. Tyrrell Gray: Gastric and Duodenal Ulcer.

FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department.

SATURDAY.—9 A.M., Mr. Vlasto: Operation on Throat, Nose and Ear. 9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Diseases of Children.

Daily 10 A.M. to 5 P.M., Saturdays 10 A.M. to 12 noon. Medical and Surgical In-patients and Out-patients. Operations, Special Departments, Anæsthetic Course.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Oct. 8th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases. Clinics. Operations.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, Oct. 9th.—5 P.M.; Dr. W. N. Goldsmith: Anatomy and Physiology of the Skin.

THURSDAY.—5 P.M. Dr. J. M. H. MacLeod: Morphology and Histopathology of Elementary Lesions.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY, Oct. 11th.—4 P.M., Dr. Payne: Nephritis from the Biological Standpoint.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

TUESDAY, Oct. 9th.—3.15 P.M.: Dr. C. C. Beatty: Anæmia.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, Oct. 9th.—4.15 P.M., Mr. J. Howson Ray: Torsion of the Omentum.

FRIDAY.—4.15 P.M., Dr. C. H. Melland: Diagnosis, Prognosis, and Treatment of Pernicious Anæmia.

ANCOATS HOSPITAL POST-GRADUATE LECTURES, Mill-street, Manchester.

THURSDAY, Oct. 11th.—3.45 P.M., Dr. W. J. S. Reid: Diseases of Sympathetic Nervous System.

Appointments.

GARROW, R. P., M.D., Ch.B. Aberd., D.P.H., has been appointed Medical Officer of Health for Hornsey.

KEANE, D. J., L.R.C.P. & S. Irel., Medical Officer for Moone, Co. Kildare, Dispensary District.

OWEN, R. D., M.R.C.S., L.R.C.P. Lond., F.R.C.S. Edin., Honorary Surgeon to the Ear, Nose and Throat Department of Cardiff Royal Infirmary.

RUSSELL, GLADYS, J. C., M.B., Ch.B. St. And., Assistant Medical Officer for Maternity and Child Welfare, Leeds.

Certifying Surgeons under the Factory and Workshop Acts: DICKENSON, G. O. M., M.B., B.S. Durh. (Olney, Bucks): HOLMES, J., M.B., B.Chir. Camb. (Southport): HUGHES, E. L., M.B. Ch.B. N.U.I. (Hawes, N. Riding); and MCINTOSH, W. J. M.B., Ch.B. Glasg. (Youlgreave, Derby).

Vacancies.

For further information refer to the advertisement columns.

Bethlem Hospital, Lambeth-road, S.E.—Two H.P.'s. Each £25 per quarter.

[illegible] and Midland Ear and Throat Hospital, [illegible] S.

[illegible] Hospital.—H.S. At rate of £200.

[illegible]dsworth Common, S.W.—H.P. £120.

Brentwood, Essex, High Wood Hospital for Children.—Second Asst. M.O. £550.

Burnley County Borough.—Asst. M.O.H., &c. £600.

Bury County Borough.—Asst. M.O.H., &c. £600.

Cardiff Royal Infirmary.—Gynæcological H.S. At rate of £50.

Coventry Voluntary Infant Welfare Centres.—Part-time M.O. £250.

Derby, Derbyshire Royal Infirmary.—Asst. H.S. and Cas. O. At rate of £150.

Dover, Royal Victoria Hospital.—H.S. £180.

Dunedin, New Zealand, Otago University.—Professor of Pathology. £1000.

East Kilbride, Hairmyres Sanatorium and Colony.—Asst. Res. P. £250.

East London Hospital for Children, &c., Shadwell, E.—H.S. At rate of £125.

Essex County Council.—Male Asst. Tub. O. £700.

Folkestone, Royal Victoria Hospital.—Jun. Res. M.O. At rate of £100.

Gloucester, Standish House Sanatorium, Stonehouse.—Asst. M.O. £250.

Halifax, Royal Halifax Infirmary.—3rd H.S. At rate of £100.

Hampstead General and North-West London Hospital, Haverstock-hill, N.W.—H.S. Also Cas. M.O. and Cas. Surg. O. Each at rate of £100.

Hertford County Hospital.—H.P. At rate of £150.

Hospital for Consumption, &c., Brompton, S.W.—H.P. At rate of £50.

King Edward Memorial Hospital, Ealing, W.—Sen. Res. S. £150.

Leeds City.—Asst. M.O. for Maternity and Child Welfare. £600.

Leicester Royal [illegible] ship.

Lincoln County [illegible] te of £150.

L.C.C. Mental [illegible] Asst. M.O. £300.

Manchester, St [illegible] H.S.'s. Each at rate of £50.

Northampton General Hospital.—Asst. H.S. to Ear, Nose and Throat Dept. At rate of £150. Also Hon. Dental S.

Paddington Green Children's Hospital, W.—H.S. At rate of £150.

Princess Louise Kensington Hospital for Children, N. Kensington. H.P. At rate of £75.

Prison Medical Service.—M.O. £350.

Richmond, Surrey, Royal Hospital.—Hon. Asst. Ophth. S.

Royal Chest Hospital, City-road, E.C.—Res. M.O. Also H.P. At rate of £150 and £100 respectively.

Royal Free Hospital, W.C.—Sen. Asst. and Third Asst. to Obstetrical and Gynæcological Unit. £350 and £270 respectively.

Royal National Orthopædic Hospital, 234, Gt. Portland-street, W. Four Surg. Regs. Each £105.

Saint Mark's Hospital for Cancer, &c., City-road, E.C.—H.S. At rate of £75.

St. Bartholomew's Hospital, E.C.—Surgeon to Throat Dept. Also Asst. Dental S.

St. Thomas's Hospital, S.E.—Physician for Mental Diseases, &c.

Shanghai Municipal Council, Public Health Dept.—Second Asst. Commissioner of Public Hea[illegible]

Southampton, Royal South Hants and [illegible] Jun. H.S. Also Cas. O. At rate [illegible]tively.

Wolverhampton, Wolverhampton and Midland Counties Eye Infirmary.—H.S. £200.

The Home Secretary gives notice of a vacancy for a Medical Referee under the Workmen's Compensation Act for the Island o[illegible] Cromarty, and Sutherland). [illegible]uld reach the Private Secretar[illegible] S.W., not later than Oct. 20th.

Births, Marriages, and Deaths.

BIRTHS.

COLWILL.—On Sept. 29th, the wife of Dr. C. K. Colwill, of Barn Rise, Wembley Park, of a daughter.

MACDONNELL.—On Sept. 26th, at 89, Lower Baggot-street, Dublin (Nursing Home) the wife of J. J. MacDonnell, M.B., of a son.

MARRIAGES.

CORCORAN—O'REILLY.—On Sept. 12th, at the Servite Roman Catholic Church, London, Dr. John Corcoran, Sutton, Surrey, to Miss Eileen O'Reilly, "Tunstall House," Worcester Park, Surrey.

RAMSAY—WIMBLE.—On Sept. 22nd, at St. Matthew's Church, Oxhey, Watford, Robert Clement Burke Ramsay, B.A., M.B., B.Ch., of Bushey, Herts, to Averil Mary Florence (Molly), only child of Dr. and Mrs. H. C. Wimble, of Oxhey, Watford.

RICHARDS—EALES.—On Sept. 26th, at St. Paul's, Herne Hill, Douglas Oliver Richards, M.B., B.Sc., to Norah Alice, second daughter of the late Mr. and Mrs. John Eales, of Sydenham.

DEATHS.

MOORE.—On Sept. 25th, at "Cheriton," The Ridgeway, Enfield, Julius Moore, M.D., aged 55.

PATON.—On Sept. 30th, suddenly, at Wester Dawyck, Stobo, Peeblesshire, Diarmid Noel Paton, F.R.S., LL.D., M.D., &c., late Regius Professor of Physiology in the University of Glasgow, aged 70.

SHARPE.—On Sept. 28th, at Darley Dale, in his sleep, William Cecil Sharpe, M.D.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

OBSERVATIONS ON THE SELECTION AND STANDARDISATION OF SURGICAL INSTRUMENTS.

By A. H. TUBBY, C.B., C.M.G., M.S. LOND.,
CONSULTING SURGEON, WESTMINSTER HOSPITAL.

I.*—THE STANDARDISATION OF SURGICAL KNIVES.

EXPERIENCED surgeons have noticed the unequal cutting properties of surgical knives, both in hospital and private practice. It has frequently happened to a surgeon that in going over his reserve stock of knives he has been compelled to reject one after another, although they may, and usually have been, recently returned from the grinders as sharp and fit for service. Some are evidently made of so soft a steel that the edge turns at once, and others prove to be sharp enough to cut cleanly through soft tissues, but their edges are deflected when brought into contact with bone. A few, and, unfortunately, a very few of them, stand much wear and tear and repeated visits to the grinders; they are cherished accordingly. It is surprising that this state of affairs should have been tolerated for so many years when we reflect upon the extent of modern knowledge and the advances which have been made in metallurgy. We know that it is possible scientifically to follow every step in the manufacture of surgical knives, from the steel bar to the finished article, when the knife ought to be fit to be placed in the hands of the operating surgeon. Therefore I make this plea for the standardisation of the metal used and the process of its manufacture.

The materials from which all ordinary forms of cutting surgical instruments are made are carbon-steel and stainless or chromium steel. Surgical knives are made from carbon-steel, whereas many knives used for domestic purposes are manufactured from stainless steel. In order to understand the qualities of the carbon-steel knife, and the reasons for its being efficient or defective, we must describe its manufacture, each stage of which is capable of scientific

FIG. 1A. FIG. 1B.

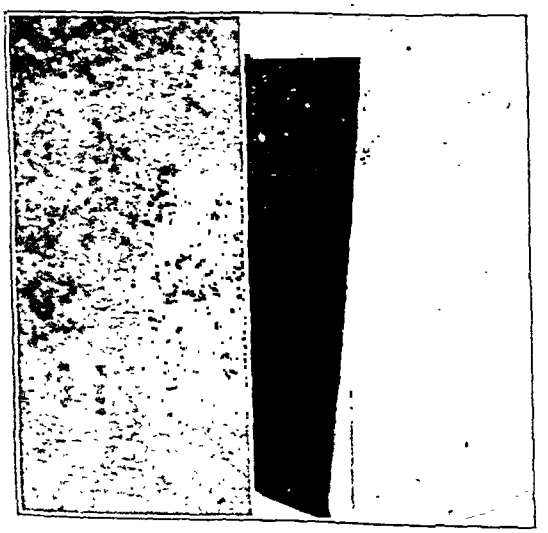


FIG. 1A.—Microscopical section of blade of knife No. 1 (× 500), showing the structure of the "pearlite." The white appearance indicates the pure or nearly pure iron, and the dark is the ferric carbide (Fe C). The Brinell hardness of this knife is 516, considerably below normal, and the structure of the pearlite should be compared with that seen in other figures. Its varied structure in the various figures emphasises variation in heat-treatment in the hardening process.

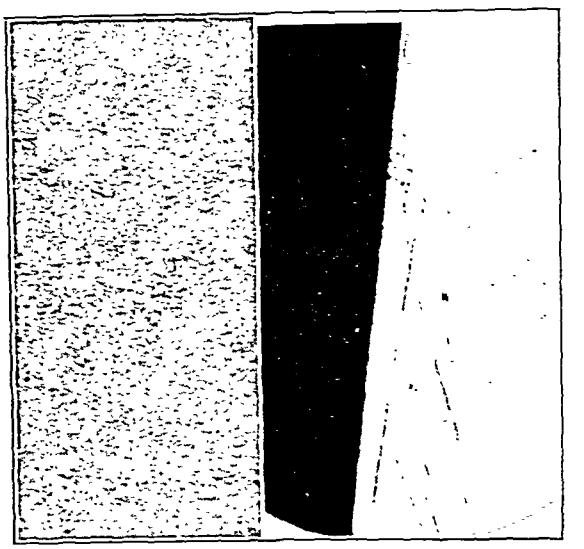
FIG. 1B.—The cutting angle of knife No. 1 (× 100). The cutting angle is 15°, rather greater than is desirable. This knife has been in use for over a year; it had recently been sent to be ground and sharpened; and the grinder has done his work well, in that he has not increased the cutting-angle of the blade to any appreciable extent.

* Part II. will appear in a coming issue.

examination and control. The stages are: (1) the composition of the carbon-steel and its microscopical structure; (2) the hardening process and its "critical" temperature; (3) the mode of tempering; (4) the manner of grinding; (5) the angle of the cutting edge.

I am indebted to Sir W. Ellis, G.B.E., Past Master Cutler of Sheffield, and managing director of Messrs. John Brown and Co., of that city, and to Mr. W. H. Hatfield

FIG. 2A. FIG. 2B.



FIGS. 2A (× 500) and 2B (× 100) (knife No. 2).—Brinell hardness index = 650—about normal. Note the more homogeneous appearance of the pearlite with the increased hardness. The cutting angle is 14½° and has not been increased in grinding.

director of the Brown-Firth Research Laboratories, who have unreservedly placed their profound knowledge of this intricate subject at my disposal. They have given me opportunities of visiting the works and laboratories and have demonstrated to me the various processes which steel instruments undergo during manufacture; and they have been so good as to carry out researches and experiments at my suggestion, especially in the examination of surgical knives. In addition, they have determined the reactions of stainless steel to various chemical solutions and reagents used in surgery, and the effect of certain physical conditions to which instruments are exposed in the course of operating. I wish to tender to them my grateful acknowledgment.

The Composition of Carbon-steel used in the Manufacture of Cutting Instruments.

First-class cutlery is made from shear carbon-steel as distinct from cast carbon-steel. Both forms of steel, however, are made by the cementation or carbonisation of Swedish wrought iron. Dr. Hatfield thus describes the process:

"The blister bars produced in this way are either piled into faggots and hammered into bars to produce shear steel, or are broken up and melted in the crucible to produce crucible cast steel. It is left to the skill of the man who examined the blister bars to determine to which temper a particular bar belonged."

A simple method of testing has been devised by Dr. Hatfield by which it is possible to determine if the finished blade has been made from shear or cast steel (Cutlery, Stainless or Otherwise, p. 13). It is not necessary to go into the point in detail here; nevertheless this test is important because for surgical uses cast steel is unsuitable. The properties and composition of shear steel are determined by chemical analysis. The best quality contains, in addition to iron, carbon 0·80–0·95 per cent., manganese 0·05 per cent., silica 0·07 per cent., sulphur 0·01 per cent., phosphorus 0·01 per cent., and no chromium. In crucible cast steel the proportions of carbon and manganese are higher.

In order to ascertain how far the composition of surgical knives supplied by the trade corresponds with these figures, I had six surgical knives, obtained from as many surgical instrument-makers, chemically analysed, and the results were as follows:—

Knife:	1	2	3	4	5	6
Carbon per cent. ..	1·07	1·15	1·18	1·14	1·13	1·12
Manganese per cent...	0·26	0·145	0·165	0·195	0·39	0·215

Other constituents were found in satisfactory proportions.

HOSPITAL, Gray's Inn-road, W.C. Wed.: Lecture-demonstration by Dr. Heald.—ROYAL WATERLOO HOSPITAL, Waterloo-road, S.E. Tues. at 2.30 P.M.: Dr. Gerald Slot (Rheumatism).—WELLCOME MUSEUM OF MEDICAL SCIENCE, 33, Gordon-street, W.C. Wed. at 4 P.M.: Demonstration by Dr. S. H. Daukes: A Synoptical Museum of Medicine—Its Value for Post-graduate Study. Further information from the Secretary.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, Oct. 8th.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Simmonds: Surgical Out-patients.

TUESDAY.—11 A.M., Mr. Endean: Venereal Diseases (Demonstration). 2 P.M., Dr. Shaw: Medical Out-patients. 4.30 P.M. (Special Lecture) Dr. Scott Pinchin: Difficulties in Diagnosis of Pulmonary Tuberculosis.

WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. 2 P.M., Mr. Tyrrell Gray: Operations. 2.30 P.M., Mr. Donald Armour: Surgical Wards.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 2 P.M., Dr. Ironside: Medical Out-patients. 2 P.M., Mr. Bishop Harman: Eye Department. 4.30 P.M. (Special Lecture): Mr. Tyrrell Gray: Gastric and Duodenal Ulcer.

FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department.

SATURDAY.—9 A.M., Mr. Vlasto: Operation on Throat, Nose and Ear. 9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Diseases of Children.

Daily 10 A.M. to 5 P.M., Saturdays 10 A.M. to 12 noon. Medical and Surgical In-patients and Out-patients. Operations, Special Departments, Anæsthetic Course.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Oct. 8th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases. Clinics. Operations.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, Oct. 9th.—5 P.M.; Dr. W. N. Goldsmith: Anatomy and Physiology of the Skin.

THURSDAY.—5 P.M. Dr. J. M. H. MacLeod: Morphology and Histopathology of Elementary Lesions.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY, Oct. 11th.—4 P.M., Dr. Payne: Nephritis from the Biological Standpoint.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

TUESDAY, Oct. 9th.—3.15 P.M.: Dr. C. C. Beatty: Anæmia.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, Oct. 9th.—4.15 P.M., Mr. J. Howson Ray: Torsion of the Omentum.

FRIDAY.—4.15 P.M., Dr. C. H. Melland: Diagnosis, Prognosis, and Treatment of Pernicious Anæmia.

ANCOATS HOSPITAL POST-GRADUATE LECTURES, Mill-street, Manchester.

THURSDAY, Oct. 11th.—3.45 P.M., Dr. W. J. S. Reid: Diseases of Sympathetic Nervous System.

Appointments.

GARROW, R. P., M.D., Ch.B. Aberd., D.P.H., has been appointed Medical Officer of Health for Hornsey.

KEANE, D. J., L.R.C.P. & S. Irel., Medical Officer for Moone, Co. Kildare, Dispensary District.

OWEN, R. D., M.R.C.S., L.R.C.P. Lond., F.R.C.S. Edin., Honorary Surgeon to the Ear, Nose and Throat Department of Cardiff Royal Infirmary.

RUSSELL, GLADYS, J. C., M.B., Ch.B. St. And., Assistant Medical Officer for Maternity and Child Welfare, Leeds.

Certifying Surgeons under the Factory and Workshop Acts: DICKENSON, G. O. M., M.B., B.S. Durh. (Olney, Bucks): HOLMES, J., M.B., B.Chir. Camb. (Southport): HUGHES, E. L., M.B. Ch.B. N.U.I. (Hawes, N. Riding); and MCINTOSH, W. J. M.B., Ch.B. Glasg. (Youlgreave, Derby).

Vacancies.

For further information refer to the advertisement columns.

Bethlem Hospital, Lambeth-road, S.E.—Two H.P.'s. Each £25 per quarter.

[illegible] and Midland Ear and Throat Hospital, [illegible] t. S.

[illegible] Hospital.—H.S. At rate of £200.

Bolingbroke Hospital, [illegible]andsworth Common, S.W.—H.P. £120.

Brentwood, Essex, High Wood Hospital for Children.—Second Asst. M.O. £550.

Burnley County Borough.—Asst. M.O.H., &c. £600.

Bury County Borough.—Asst. M.O.H., &c. £600.

Cardiff Royal Infirmary.—Gynæcological H.S. At rate of £50.

Coventry Voluntary Infant Welfare Centres.—Part-time M.O. £250.

Derby, Derbyshire Royal Infirmary.—Asst. H.S. and Cas. O. At rate of £150.

Dover, Royal Victoria Hospital.—H.S. £180.

Dunedin, New Zealand, Otago University.—Professor of Pathology. £1000.

East Kilbride, Hairmyres Sanatorium and Colony.—Asst. Res. P. £250.

East London Hospital for Children, &c., Shadwell, E.—H.S. At rate of £125.

Essex County Council.—Male Asst. Tub. O. £700.

Folkestone, Royal Victoria Hospital.—Jun. Res. M.O. At rate of £100.

Gloucester, Standish House Sanatorium, Stonehouse.—Asst. M.O. £250.

Halifax, Royal Halifax Infirmary.—3rd H.S. At rate of £100.

Hampstead General and North-West London Hospital, Haverstock-hill, N.W.—H.S. Also Cas. M.O. and Cas. Surg. O. Each at rate of £100.

Hertford County Hospital.—H.P. At rate of £150.

Hospital for Consumption, &c., Brompton, S.W.—H.P. At rate of £50.

King Edward Memorial Hospital, Ealing, W.—Sen. Res. S. £150.

Leeds City.—Asst. M.O. for Maternity and Child Welfare. £600.

Leicester Royal Infirmary.—Surgical Dressership.

Lincoln County Hospital.—Jun. H.S. At rate of £150.

L.C.C. Mental Hospital Service.—Eighth Asst. M.O. £300.

Manchester, St. Mary's Hospitals.—Four H.S.'s. Each at rate of £50.

Northampton General Hospital.—Asst. H.S. to Ear, Nose and Throat Dept. At rate of £150. Also Hon. Dental S.

Paddington Green Children's Hospital, W.—H.S. At rate of £150.

Princess Louise Kensington Hospital for Children, N. Kensington. H.P. At rate of £75.

Prison Medical Service.—M.O. £350.

Richmond, Surrey, Royal Hospital.—Hon. Asst. Ophth. S.

Royal Chest Hospital, City-road, E.C.—Res. M.O. Also H.P. At rate of £150 and £100 respectively.

Royal Free Hospital, W.C.—Sen. Asst. and Third Asst. to Obstetrical and Gynæcological Unit. £350 and £270 respectively.

Royal National Orthopædic Hospital, 234, Gt. Portland-street, W. Four Surg. Regs. Each £105.

Saint Mark's Hospital for Cancer, &c., City-road, E.C.—H.S. At rate of £75.

St. Bartholomew's Hospital, E.C.—Surgeon to Throat Dept. Also Asst. Dental S.

St. Thomas's Hospital, S.E.—Physician for Mental Diseases, &c.

Shanghai Municipal Council, Public Health Dept.—Second Asst. Commissioner of Public Hea[illegible]

Southampton, Royal South Hants and [illegible] Jun. H.S. Also Cas. O. At rate [illegible]tively.

Wolverhampton, Wolverhampton and Midland Counties Eye Infirmary.—H.S. £200.

The Home Secretary gives notice of a vacancy for a Medical Referee under the Workmen's Compensation Act for the Island of Lewis (Sheriffdom of Ross, Cromarty, and Sutherland). Applications for the post should reach the Private Secretary, Scottish Office, Whitehall, S.W., not later than Oct. 20th.

Births, Marriages, and Deaths.

BIRTHS.

COLWILL.—On Sept. 29th, the wife of Dr. C. K. Colwill, of Barn Rise, Wembley Park, of a daughter.

MACDONNELL.—On Sept. 26th, at 89, Lower Baggot-street, Dublin (Nursing Home) the wife of J. J. MacDonnell, M.B., of a son.

MARRIAGES.

CORCORAN—O'REILLY.—On Sept. 12th, at the Servite Roman Catholic Church, London, Dr. John Corcoran, Sutton, Surrey, to Miss Eileen O'Reilly, "Tunstall House," Worcester Park, Surrey.

RAMSAY—WIMBLE.—On Sept. 22nd, at St. Matthew's Church, Oxhey, Watford, Robert Clement Burke Ramsay, B.A., M.B., B.Ch., of Bushey, Herts, to Averil Mary Florence (Molly), only child of Dr. and Mrs. H. C. Wimble, of Oxhey, Watford.

RICHARDS—EALES.—On Sept. 26th, at St. Paul's, Herne Hill, Douglas Oliver Richards, M.B., B.Sc., to Norah Alice, second daughter of the late Mr. and Mrs. John Eales, of Sydenham.

DEATHS.

MOORE.—On Sept. 25th, at "Cheriton," The Ridgeway, Enfield, Julius Moore, M.D., aged 55.

PATON.—On Sept. 30th, suddenly, at Wester Dawyck, Stobo, [illegible] Paton, F.R.S., LL.D., M.D., &c., Physiology in the University of [illegible]

SHAR[illegible] [illegible]arley Dale, in his sleep, William Cecil Sharpe, M.D.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Our observations, and examination of the six knives ferred to above, show that the hardening is often incom-ete, and has not been carried out properly. It has not en controlled scientifically by a pyrometer, nor have the sults been checked either by the microscope or the Brinell" hardness test; in fact, in one of the knives no rdening at all appears to have been attempted (see g. 4A).

The Brinell ball-hardness test † has shown that the andard hardness of a hardened carbon-steel blade should e represented by the figure 650. All sharp surgical instru-ents should approximate to this figure in hardness. We ubmitted the six trade surgical knives to the Brinell ball-ardness test.

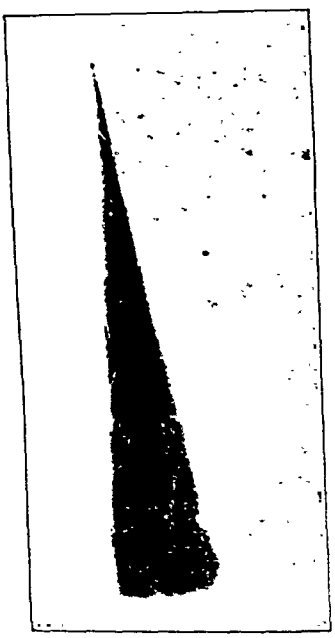
Knife 1=546; 2=650; 3=630; 4=270; 5=650; 6=650.

Therefore knives Nos. 1 and 3 have not the requisite ardness; No. 4 has probably not been hardened at all, whilst blades Nos. 2, 5, and 6 might be expected to behave atisfactorily; in fact, knives Nos. 5 and 6 have done so. No. 5 has had 10 to 15 years' wear and tear in all kinds of operations, and has been frequently re-sharpened. Its manufacture was either on approved scientific lines or else t has acquired its hardness empirically, like the old Toledo and Damascus sword-blades. It should be noted that in blade No. 6 (Figs. 6A, 6B) the edge has become re-curved. This knife was submitted to a severe operation test, having been used in the removal of two bunions, and was often in forcible contact with eburnated bone.

The microscopic appearances of the pearlite should also be noted, whether there is or is not a nearly complete solid solution; the greater the hardness the more nearly does the pearlite approach to uniformity in microscopical sections (Figs. 2A and 3A).

Steel, however, which has been so hardened and quenched in water is possessed of internal stresses which render it brittle; in fact, it requires "tempering."

FIG. 7A.

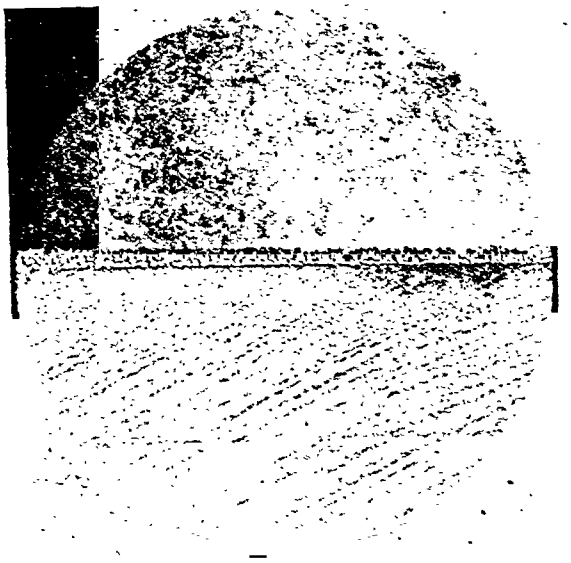


The Tempering of Shear Carbon-Steel Blades.

The effect of this process is to remove the internal stresses left in the blade after quenching in water or oil. Tempering or re-heating the blade to a low temperature causes a slight softening by the effect of that heat upon the hardened steel blade. Proper tempering is in essence accompanied by a slight breaking down of the solid solution, and the carbide of iron begins to reappear. When this change has just commenced the blade is said to be tempered "properly," and has acquired the requisite degree of toughness for its purpose. The tempering of carbon-steel is generally done at temperatures ranging from 180° to 212° C., according to the degree of hardness required in the finished article. Surgical knives made of carbon-steel are tempered at 100° to 150° C., whilst stainless steel domestic cutlery is tempered at 180°. The process of tempering must be distinguished from that of "annealing," which means softening—i.e., as much as possible. It is true that the two processes are kindred, in that they involve re-heating to a certain temperature, but the temperature in annealing is higher than that in tempering. Further, the articles are usually cooled slowly from the annealing temperature, whereas they are usually, but not always, cooled quickly in the tempering operation.

In making a surgical knife the steel leaves the manufacturer's hands in the form of a bar; the cutler then forges,

FIG. 7B



Enlargements (×100) of the cutting-edge of knife No. 5. In Fig. 7B the regularity of the cutting-edge is seen, and further serves to illustrate the truth that every knife-edge is a saw in miniature.

hardens, and tempers the blade, and the grinder finishes it. When the handle and blade are made from the same piece, it is only the blade which is heated to the high temperature required for hardening; the handle is left soft.

The Mode of Grinding and the Cutting Angle of the Knife.

Grinding must be done with much care and patience, otherwise heat is generated during the procedure and over-tempering or annealing sets in; this renders the blade softer than it should be and deprives it of cutting power. The secrets are to grind slowly and patiently, and to use plenty of cold water so as to avoid heating the blade. The shape to which the blade is ground depends on the purpose to which the knife is to be put. Thus, the ordinary trade blade differs in the outline of its cutting edge and the solidity of its back from an old-fashioned lithotomy knife or from one formerly used in Cock's operation.

The cutting edge of the knife when viewed in cross-section shows what is known as the "cutting angle." Referring again to the knives which were tested and reported upon, it was found that the cutting angles had a wide range—viz., from 10½° to 18°. In knife No. 6 (Fig. 6B), after use in a prolonged bone operation the edge was actually re-curved like that of a wave about to break. The measurement of the angles of the six knives were found to be:—

No. 1, 15°; No. 2, 14½°; No. 3, 12°; No. 4, 18°; No. 5, 13°; No. 6, 10½°.

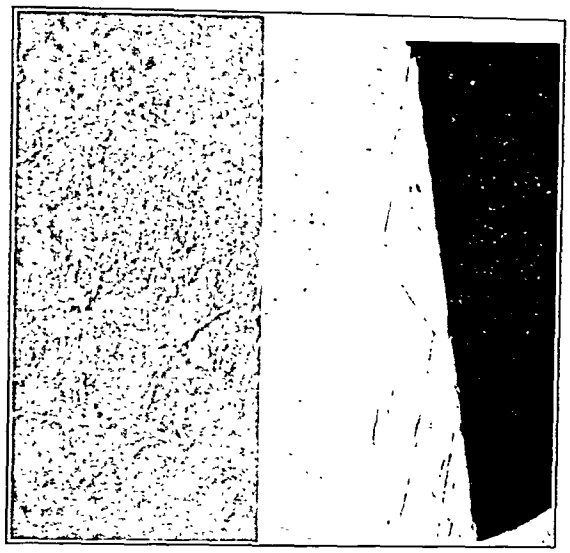
It is quite clear that there has been no logical system adopted by the manufacturers in producing these edges; the best angle is 12·5°. In most knives there are two angles to be considered: the first is the cutting angle ground on the blade as a whole, and the second is the cutting angle ground on the sharp edge of the blade, the latter then becoming the actual cutting angle of the knife. Whilst the angles of the blades themselves were found to be from 10½°–18°, the actual cutting angle, owing to the activities of the knife-grinder, was found to be in one instance as high as 34°. The cutting edge of the blade has therefore been somewhat rounded off as in Fig. 5B, and such an edge will soon become blunt. The grinder should strive to keep the knife on the flat, as parallel as possible with the stone, when re-sharpening it, and be careful not to increase the angle of the edge.

All surgeons know that a knife should not be boiled, for this alters its temper and softens its cutting edge; when it encounters hard tissues it re-curves. It seems that this plea for the standardisation of surgical cutting instruments is necessary. We ought to be sure that we are buying the best article which can be made; that we can rely upon it to do its work to stand wear and tear, and that when sent to be

† Dr. Hatfield writes to me about this test: "The researches which we have done into the behaviour of cutlery of different kinds have shown that the intrinsic hardness of the blade prior to grinding is the determining factor, and we have devised a rather interesting method here of using the Brinell ball-hardness test on such thin articles. A very small steel ball is pressed into the blade under a known but always constant load. The result is that an impression is made which is smaller the harder the steel. By dividing the area of the impression into the load we have the means of getting a definite quantity which can be compared with a standard, and as a matter of fact we have correlated our values with the standard Brinell scale."

It will be seen from the table above that, whilst the carbon element is fairly constant, that of manganese varies within wide limits; in fact, there is little or no evidence of standardisation.

FIG. 3A. FIG. 3B.

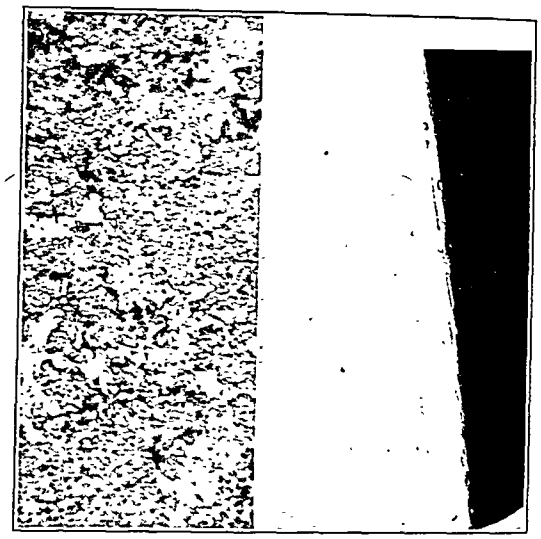


FIGS. 3A (× 500) and 3B (× 100).—This knife has been used once at an operation and has not been re-sharpened. The Brinell hardness is 630, and the structure of the pearlite is not so homogeneous as in 2A. The angle of the blade is 12°, but the cutting edge is frayed and split after use on soft tissues only.

The Hardness of Shear Carbon-Steel.

The cutting properties of knives and other sharp instruments depend mainly upon two processes which the steel undergoes—viz., hardening and tempering. When we examine steel of 0·9 per cent. carbon-content under a microscope, we observe that the section consists entirely of "pearlite," which appears to be a more or less structureless mass at low magnifications. Under higher powers, however, pearlite shows two widely contrasting appearances: First a white background, which is the iron-content, and secondly, black deposits of carbide of iron (Fe_3C), which are scattered irregularly over the white background (Fig. 1A). If the crude steel could be examined microscopically when hot it would be found more uniform in appearance, as we see when we contrast Figs. 4A and 5A. The iron in Fig. 4A has not been hardened at all. The pure iron has absorbed heat and has dissolved up most of the carbide of iron and formed a "solid solution" of hard steel in Fig. 5A.

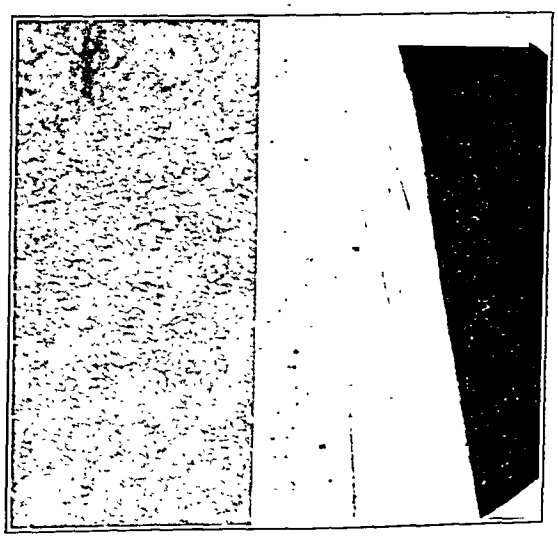
FIG. 4A. FIG. 4B.



FIGS. 4A (× 500) and 4B (× 100).—This knife is as it came from the surgical instrument makers. It is a bad knife. Its Brinell index is only 270, and the structure of the pearlite (Fig. 4A) is coarse and blotchy. In fact, it is very doubtful if it has been subjected to any proper hardening and tempering processes.

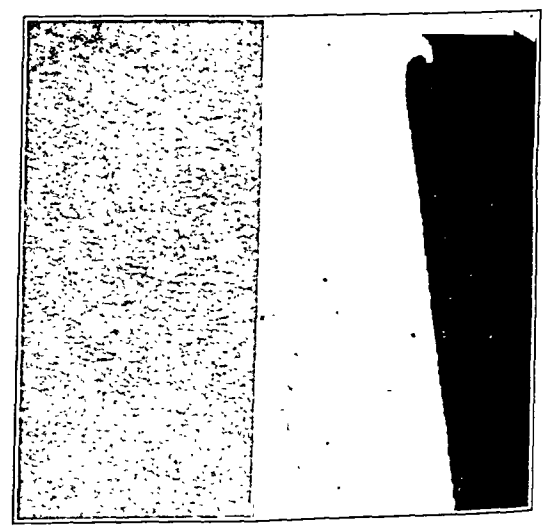
It is essential to know at what temperature this momentous change takes place in shear carbon-steel. By using a thermo-electric pyrometer, Dr. Hatfield has shown that the "critical point" of the change is 730° C. Dr. Hatfield states that "if steel is heated to a temperature at which the 'solid solution' is in existence, and is then 'quenched' in water, it is hard." In fact, it has undergone a scientific process of hardening.

FIG. 5A. FIG. 5B.



FIGS. 5A (× 500) and 5B (× 100).—This knife is an old and a cherished one. It has been in use for several years and has been frequently re-sharpened and stood the process well, as its hardness is normal—viz., 650. The angle of the blade is 13°, but the actual cutting angle of the edge is 34°, owing to indifferent grinding. In spite of the increase of the latter angle the knife was very serviceable, because of the hardness of its composition. In Figs. 7A and 7B, is seen an enlargement (× 100) of the cutting edge.

FIG. 6A. FIG. 6B.



FIGS. 6A (× 100) and 6B (× 100).—This knife has been subjected to a severe test. Its composition is not normal, as there was too much manganese present, and the cutting-angle has been reduced by grinding to 10½°, so that the knife was not able to stand the severe testing it has had in a prolonged operation on bone, and the edge of its blade has become re-curved.

Our observations, and examination of the six knives referred to above, show that the hardening is often incomplete, and has not been carried out properly. It has not been controlled scientifically by a pyrometer, nor have the results been checked either by the microscope or the "Brinell" hardness test; in fact, in one of the knives no hardening at all appears to have been attempted (see Fig. 4A).

The Brinell ball-hardness test † has shown that the standard hardness of a hardened carbon-steel blade should be represented by the figure 650. All sharp surgical instruments should approximate to this figure in hardness. We submitted the six trade surgical knives to the Brinell ball-hardness test.

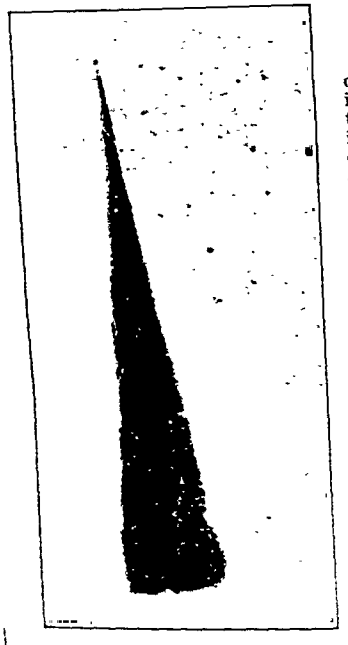
Knife 1=546; 2=650; 3=630; 4=270; 5=650; 6=650.

Therefore knives Nos. 1 and 3 have not the requisite hardness; No. 4 has probably not been hardened at all, whilst blades Nos. 2, 5, and 6 might be expected to behave satisfactorily; in fact, knives Nos. 5 and 6 have done so. No. 5 has had 10 to 15 years' wear and tear in all kinds of operations, and has been frequently re-sharpened. Its manufacture was either on approved scientific lines or else it has acquired its hardness empirically, like the old Toledo and Damascus sword-blades. It should be noted that in blade No. 6 (Figs. 6A, 6B) the edge has become re-curved. This knife was submitted to a severe operation test, having been used in the removal of two bunions, and was often in forcible contact with eburnated bone.

The microscopic appearances of the pearlite should also be noted, whether there is or is not a nearly complete solid solution; the greater the hardness the more nearly does the pearlite approach to uniformity in microscopical sections (Figs. 2A and 3A).

Steel, however, which has been so hardened and quenched in water is possessed of internal stresses which render it brittle; in fact, it requires "tempering."

FIG. 7A.

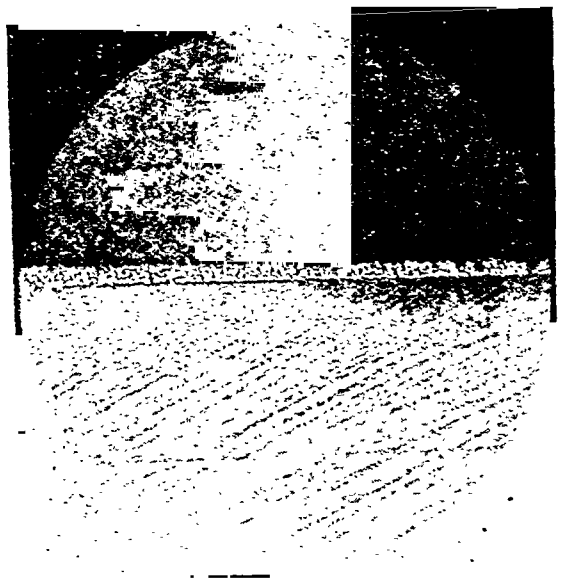


The Tempering of Shear Carbon-Steel Blades.

The effect of this process is to remove the internal stresses left in the blade after quenching in water or oil. Tempering or re-heating the blade to a low temperature causes a slight softening by the effect of that heat upon the hardened steel blade. Proper tempering is in essence accompanied by a slight breaking down of the solid solution, and the carbide of iron begins to reappear. When this change has just commenced the blade is said to be tempered "properly," and has acquired the requisite degree of toughness for its purpose. The tempering of carbon-steel is generally done at temperatures ranging from 180° to 212° C., according to the degree of hardness required in the finished article. Surgical knives made of carbon-steel are tempered at 100° to 150° C., whilst stainless steel domestic cutlery is tempered at 180°. The process of tempering must be distinguished from that of "annealing," which means softening—i.e., as much as possible. It is true that the two processes are kindred, in that they involve re-heating to a certain temperature, but the temperature in annealing is higher than that in tempering. Further, the articles are usually cooled slowly from the annealing temperature, whereas they are usually, but not always, cooled quickly in the tempering operation.

In making a surgical knife the steel leaves the manufacturer's hands in the form of a bar; the cutler then forges,

FIG. 7B



Enlargements (×100) of the cutting-edge of knife No. 5. In Fig. 7B the regularity of the cutting-edge is seen, and further serves to illustrate the truth that every knife-edge is a saw in miniature.

hardens, and tempers the blade, and the grinder finishes it. When the handle and blade are made from the same piece, it is only the blade which is heated to the high temperature required for hardening; the handle is left soft.

The Mode of Grinding and the Cutting Angle of the Knife.

Grinding must be done with much care and patience, otherwise heat is generated during the procedure and over-tempering or annealing sets in; this renders the blade softer than it should be and deprives it of cutting power. The secrets are to grind slowly and patiently, and to use plenty of cold water so as to avoid heating the blade. The shape to which the blade is ground depends on the purpose to which the knife is to be put. Thus, the ordinary trade blade differs in the outline of its cutting edge and the solidity of its back from an old-fashioned lithotomy knife or from one formerly used in Cock's operation.

The cutting edge of the knife when viewed in cross-section shows what is known as the "cutting angle." Referring again to the knives which were tested and reported upon, it was found that the cutting angles had a wide range—viz., from 10½° to 18°. In knife No. 6 (Fig. 6B), after use in a prolonged bone operation the edge was actually re-curved like that of a wave about to break. The measurement of the angles of the six knives were found to be:—

No. 1, 15°; No. 2, 14½°; No. 3, 12°; No. 4, 18°; No. 5, 13°; No. 6, 10½°.

It is quite clear that there has been no logical system adopted by the manufacturers in producing these edges; the best angle is 12·5°. In most knives there are two angles to be considered; the first is the cutting angle ground on the blade as a whole, and the second is the cutting angle ground on the sharp edge of the blade, the latter then becoming the actual cutting angle of the knife. Whilst the angles of the blades themselves were found to be from 10½°–18°, the actual cutting angle, owing to the activities of the knife-grinder, was found to be in one instance as high as 34°. The cutting edge of the blade has therefore been somewhat rounded off as in Fig. 5B, and such an edge will soon become blunt. The grinder should strive to keep the knife on the flat, as parallel as possible with the stone, when re-sharpening it, and be careful not to increase the angle of the edge.

All surgeons know that a knife should not be boiled, for this alters its temper and softens its cutting edge; when it encounters hard tissues it re-curves. It seems that this plea for the standardisation of surgical cutting instruments is necessary. We ought to be sure that we are buying the best article which can be made; that we can rely upon it to do its work to stand wear and tear, and that when sent to be

† Dr. Hatfield writes to me about this test: "The researches which we have done into the behaviour of cutlery of different kinds have shown that the intrinsic hardness of the blade prior to grinding is the determining factor, and we have devised a rather interesting method here of using the Brinell ball-hardness test on such thin articles. A very small steel ball is pressed into the blade under a known but always constant load. The result is that an impression is made which is smaller the harder the steel. By dividing the area of the impression into the load we have the means of getting a definite quantity which can be compared with a standard, and as a matter of fact we have correlated our values with the standard Brinell scale."

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Among the ultramicroscopic viruses, said Dr. Levaditi, there is a group whose members are all similar in their general characters and in their affinity for fibroblastic tissue. This group of neurotropic and dermotropic viruses includes the following: cow-pox, vaccinia, epidemic poliomyelitis, encephalitis lethargica, herpes, and rabies. Some of these viruses, such as poliomyelitis virus, are purely neurotropic; others, such as cow-pox and vaccinia, are purely dermotropic; whilst others again, such as herpes virus, are both neutropic and dermotropic.

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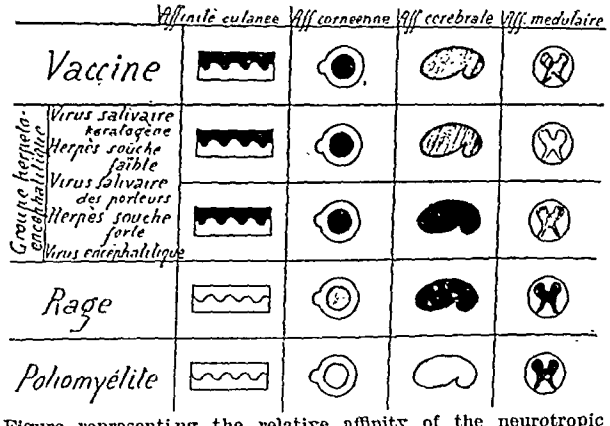

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Grand Curiosity

AS EXEMPLIFIED IN THE LIFE OF JOHN HUNTER.

Being the Hunterian Oration delivered before the Annual Clinical Congress of the American College of Surgeons

BY SIR SQUIRE SPRIGGE, M.D., F.R.C.P., F.R.C.S.,
EDITOR OF "THE LANCET."

THERE is not only an adequate life of John Hunter in existence and an excellent skeleton life in the National Dictionary of Biography, but for a long series of years official and pious orations have been delivered in his memory. Of these, naturally, the most important have been delivered in the theatre of the Royal College of Surgeons of England, adjacent to the Hunterian Museum, that eternal monument which he erected to his own memory, and have been published separately or in the columns of THE LANCET. It is therefore unnecessary, and indeed would be impertinent, for me to describe in any detail to such an audience as this the life of Hunter, but in order to give meaning and coherence to the reflections which his tremendous work evokes in me at the present moment, it is fitting to remind you of a few salient points in his biography.

THE FARMER'S BOY.

John Hunter was born 200 years ago, on Valentine's Eve or Day of 1728, at his father's farm near Glasgow. Youngest of a family of ten, he disliked school, hated books, lived in the open fields as far as was possible, studied animal life, especially birds and insects, "mucked about" (pardon the slang; there is no other appropriate expression for it) his father's farm, was apprenticed for a time to a relative, a timber merchant and cabinet maker, and with that odd equipment turned up in London at the age of 20 to assist an elder brother William, who was at that time conducting a successful anatomy school in London. Of that school much has been written, for formal education in anatomy in Great Britain had its foundation there, but just before the bicentenary celebrations in honour of John Hunter, which took place in London last February, through the mediation of that famous disciple of Hunter, Sir Arthur Keith, and the generosity of Dr. Louisa Hamilton, there came into the possession of THE LANCET a series of letters which describe from a contemporary pen the life of the Hunters at the time when this school was at the zenith of its work. The letters were written by Dr. Louisa Hamilton's ancestor, William Hamilton, to his father, Thomas Hamilton, professor of anatomy in the University of Glasgow, and a friend of the Hunter family. The fact that the Hunters were friends of the Hamiltons in itself indicates that John Hunter's father was in association with one of the most brilliant of Scottish intellectual clans; for these were the Hamiltons, three of whom were professors of anatomy in the University of Glasgow, and one of whom, Sir William Hamilton, was the philosopher of world-fame. Sir William Hamilton's grandfather, Thomas Hamilton, professor of anatomy in the University of Glasgow in 1751, was a fellow student of John Hunter, though his senior, and rode with John when he proceeded on horseback to join William Hunter in London in September, 1748. Later—namely, in 1777—William Hamilton followed in the footsteps of his father, coming to London to study with both William and John Hunter, and the charming and informative letters which William then wrote to his parents tell an intimate story of the social milieu in which the Hunters lived, as well as indicate the absorbing way in which the anatomical studies of the school were pursued. The indication may be slight, but the picture which they draw is clear.

THE ANATOMICAL ASSISTANT.

To return to John, he became a mad dissector, and while he walked the medical school of St. George's Hospital he was all the time laying the foundations of, and even elaborating, new studies of comparative anatomy, collating what might be called the lessons derived from a lack of education as a boy with an intensive training as a young man. For one who was to become the greatest and most original comparative anatomist the world has ever seen, no better training could have been received than that of John Hunter—a statement which sounds like an indictment of all academic education. He knew the habits, the mating times, the sex differentiations, the obstetric procedure, and the farm farriery of a vast range of living creatures, and being a genius (for had he not been a genius he never could have acquired, remembered, or sorted up his knowledge) he applied this compost of heterogeneous wisdom, which was all teeming in his brain, to the intensive study of human anatomy, everlastingly asking himself why these things happened, why these structures were so constructed, why they underwent this or that change at this or that epoch, and finding material for his answers by looking at the known facts of structural anatomy in the light of phenomena observed by himself. And in addition to all this he had unusual technical ability for the manual work of dissection. The inspiration throughout was a grand curiosity—What? and Why?

Until he was just over 30 years of age John Hunter remained an anatomical assistant in his brother's medical school. William Hunter was, in particular, a great teacher, but he seems to have come the senior over John in an unfair way, though it must not be forgotten that he had absolutely supported him. Anyhow, John, while William's assistant, traced the descent of the testis in the fœtus and made discoveries as to the nature of the placental circulation, which William later claimed as his own, apparently because they were done in his school. It was clearly time that the brothers parted, and in 1759 symptoms of lung trouble manifested themselves in John, who was always a physically delicate man. Now this was a misfortune which in the event was a blessing. For it led to John Hunter applying for a staff appointment in connexion with some military and naval operations being conducted off the coast of France—what is known as the Seven Years' War being in course of decision. Hunter was stationed at Belle Isle, and later in Portugal, using his opportunities to make assiduous and first-hand observations on the anatomy and physiology of sea birds, fishes, and all marine zoology along its lower planes, while at the same time he acquired a knowledge of military surgery as understood at that epoch, studied the conditions of the coagulation of the blood, and probably made his first investigations as to the state among certain animals of hibernisation. It was during this period presumably that he started his wonderful collection.

INDEPENDENCE.

At the close of the Seven Years' War he returned to London with a certain amount of half-pay and a marvellous store of unrecorded wisdom to rely upon for a professional livelihood, while he had increased his responsibilities by an engagement to Anne Home, the daughter of one of his superior officers. He decided to teach anatomy while building up a surgical practice. He started to teach and to practise in Golden-square, a square almost adjoining Regent-street (though so difficult to find) which was at that time a residential district; and although there seems to be no evidence that he made any particular mark at once, he was able in the course of five years to find the money for the purchase of the lease of some land in the neighbourhood of what is now known as the Earl's Court-road, where he built a house. This was in 1765, but it was not until 1771 that he seems to have found time to marry Anne Home. In the meanwhile he took resident pupils in Golden-square, held anatomy classes, practised as a surgeon, and continued to

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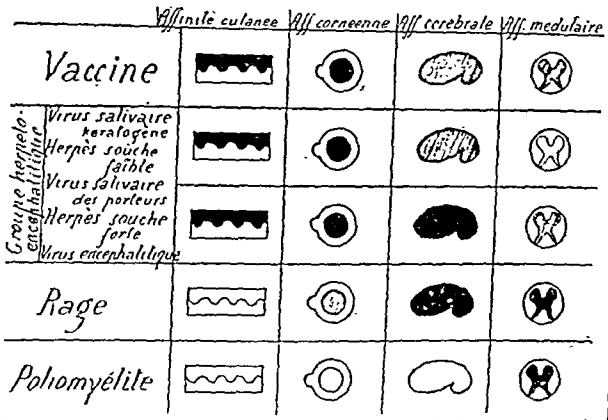

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not conceived of by Hunter have arisen. His conceptions were entirely mechanistic, and it is now fairly universally admitted that mechanistic explanations are insufficient, the arena of dispute being the place at which something more than a mechanistic solution is called for.

HARVEY, HUNTER, AND LISTER.

But what Hunter did is so wonderful that any attempt to comment fairly upon it in a few words must be inadequate, and we need spend no time in discussing whither his philosophy might have led him if he were still with us. The essential outcome of his work was practical, and that is why he is the father of modern surgery; and the range over which his teaching had a practical bearing was so vast that, if for this quality only, he takes his place with Harvey and Lister.

Harvey's work was as concentrated as Hunter's was diffuse. Harvey was for many years of his life absorbed in the elucidation of one problem—the greatest problem in all physiology it may be granted, but for its solution the necessary wisdom was likely to be of a concentrated sort. It was, indeed, probable—and so it proved in the event—that much of the necessary evidence was already in the possession of the initiated, what was required being the sifting and marshalling of that evidence so that it should demonstrate the truth. In doing this Harvey was triumphantly successful in what has been described by Sir Arthur Keith as the finest piece of detective work that science can show, and the perfection of that work is perhaps best manifested by the researcher's necessity to assume the existence of structures which were hidden from the naked eye until after Harvey's death. No general curiosity would have assisted Harvey; indulgence in it might only have served to divert his attention from the central problem. That his discovery, by revolutionising all conceptions of physiology, had an importance ranging further than anything Hunter ever accomplished was due to its nature and not to Harvey's individual conceptions. Yet nothing that Hunter ever did would have had any meaning if Harvey had not supplied the sound physiological basis for the work.

Lister again was as concentrated in his work as Hunter was diffuse. The fact that Lister's immense discovery had as far-ranging an influence over the comprehension of disease as Harvey's discovery had over the comprehension of physiology was due to the nature of the discovery and not to the discoverer's conceptions of his work. Lister, like Harvey, was a highly educated man, both generally, and specially for the task which he set himself, and that task was, in its original shape, to prove that by precautions against infection the mortality in certain cases of disease or injury could be prevented. By endless pains directed to that end he achieved his purpose and lived to see the limitless boon which he had conferred upon mankind in directions which he could not have foreseen. No general curiosity as to the laws of life would have advanced his researches immediately.

Hunter was the middle term. Without Harvey's discovery all the wide-ranging physiological researches, as far as they could have been conducted, would have been radically wrong in conception, even though occasionally correct in deduction, and many of the researches would never have been attempted. For example, without a right knowledge of the physics of the circulation of the blood how could Hunter have transformed his observations on the blood-supply of the antler's velvet into comprehension of the possibilities of collateral circulation in the human subject, with its results, the devising of a radical cure for aneurysm? And in a similar way the whole of Hunter's original surgical work was based, we can assume safely, upon his own physiological studies, as he departed more and more from the traditional teachings of his day. How great the expansion of clinical surgery was under Hunter's teaching is best gathered from reading the treatise on surgery by his devout disciple, Abernethy. This treatise, in its original shape, was largely a reprint of Abernethy's lectures to his classes at St. Bartholomew's Hospital, which were printed in THE LANCET in defiance of the lecturer's prohibition. The proceeding on the part of the Founder of THE LANCET was denounced by the leaders of medicine as a deed of flat piracy, and hailed by the rank and file of the profession as a proper spreading of the gospel improperly withheld from them. The reporting of the lectures became the subject of furious action in law-courts, and the dispute was finally decided in Wakley's favour—to become, I believe, a leading precedent. It is a curious reflection that it should be easier to follow Hunter's teaching through the medium of his disciple than through his own words—it was the one ill-result of John Hunter's defective education that he was an ineffective writer—but the literary work that he had in view, and died without accomplishment, was surely an all-round treatise on comparative anatomy, and not a resumed application of his multifarious wisdom directed to clinical surgery. Of such a work the catalogue of his marvellous museum would have formed the backbone; already the skeleton existed, and much of the material wherewith to clothe the bones had been actually written and rewritten in obedience to the unquenchable curiosity that kept him ever questioning—when death removed the author and a malignant fate consigned his manuscripts to treacherous hands.

If Hunter's theories, researches, experiments, and results would have been impossible or vitiated, or minimised without the sure foundation of the "De Motu Cordis," published precisely 100 years before Hunter was born, so Lister's work, which took definite shape some 70 years after Hunter's death would have been of infinitely less significance without the progress in surgical science initiated by Hunter and developed with the discovery of anæsthesia. Failing these things, the application of Lister's theories must have been sadly smaller at first, for many of the situations where the combating of sepsis was the key to the relief of symptoms and perhaps to the cure of the patient would never have presented themselves to the surgeon.

THE WISDOM OF THE CHILD.

Gentlemen, I hope that you will agree with me in finding that the leading characteristic of John Hunter was his grand curiosity—and how should it have been otherwise? Where could he have derived lessons from, what accepted wisdom could he have imbibed and from what sources, when he was inventing his science, as he went along, and knew not where his imaginings and their progressive realisations were leading him? Hunter's was the wisdom of the child who has the new game of life before him, knowing neither the rules nor the chances, but who learns to follow the first and meet the second by perpetually asking What? and Why?

It is out of no disrespect to you, Sirs, that I make my oration so brief; I anticipate your gratitude for my brevity. It has seemed to me that we should be paying higher honours to Hunter if, instead of familiarising, or refamiliarising, ourselves with biographical details we considered one salient quality in his character which, in my humble belief, was the quality which counted first in all that he did.

The rise from kail-yard peasant to world-famed philosopher; the life of piquant happenings; the self-infection with the disease whose pathology he expounded and whose sequelæ were fatal to him; the dramatic death within the walls of St. George's Hospital (the scene of his clinical triumphs); the holocaust made of [illegible] by a trusted relative; the exh[illegible] [illegible]es fo[illegible]rial in Westminster Ab[illegible] [illegible]gs [illegible] that you know of, an[illegible] [illegible] in order that I m[illegible] [illegible]ition. figure in medi[illegible] [illegible]tional child! For I [illegible] what a Maker of all [illegible] on the evidence su[illegible] [illegible]om the which [illegible] the plan [illegible] curiosity.

collect specimens. It was at this epoch that he secured the refusal of the carcasses of all the animals dying in the menagerie then attached to the Tower of London, and as the menagerie was placed in the fosse around the walls of the Tower it seems likely that the death-rate among the beasts was a high one. In one of the lives of Hunter—Oldrey's probably—we find it related that he gave £5 for a dying tiger and had to borrow the money from a bookseller, an anecdote which confirms the statement of Sir Everard Home that Hunter always kept himself penniless by disbursing all that he gained upon his collection. But Home's criticism of his brother-in-law does not consort with the facts that in 1765 Hunter should have been able to carry out such a financial transaction as that at Earl's Court, while in 1768 he moved from Golden-square into a large house in Jermyn-street. He must have been making a substantial income as a surgeon, or his profuse purchases would have drained his resources, but the move to Jermyn-street was quite probably a wise financial action, giving him more space in which to accommodate house pupils. For he was able to charge what was in those days the large sum of 500 guineas for the privilege of apprenticeship to himself, and it was in Jermyn-street that he received a pupil whose name is as widely known as his own—namely, Edward Jenner. In this way Hunter and Jenner came to be eternal ornaments to my hospital, St. George's.

Hunter's life at Earl's Court is the clue to his personality—it was one long exposition of his quality of an insatiable curiosity. It was the life of the curator of the most remarkable menagerie the world has ever seen, assembled in order that the inmates should give up to their owner the secrets of their lives, the reasons for their being. Mammals, birds, fishes, and reptiles—ranging from buffaloes and eagles to lizards and eels—were there collected, bred, experimentally treated, and cross-fertilised where possible. He transplanted the spurs of his cocks into their combs; he fed swine with dyes till their bones were coloured; and every living thing under his care was watched in its periods of health, development, and pathological attack that it might answer some pertinent question in physiology. Dogs and jackals, horses and zebras were mated with a view to the solution of problems of fertilisation and hybridisation; his early studies in aquatic zoology were continued in ponds specially dug to receive fish, frogs, leeches, and especially eels, whose life-history he perceived to be mysterious; in vaults or dens he kept his larger beasts, and seems to have been fearless in his management of them.

From Structure to Function.

Some of the multifarious directions whither Hunter's grand curiosity led him are revealed in a profuse correspondence which took place between him and his famous pupil, Edward Jenner—a pupil after his own heart. Nothing was known or even suspected during Hunter's life of what we should now describe as the phenomena of immunity, nor was Jenner's first inoculation as a treatment for small-pox performed until three years after Hunter's death, but Hunter recognised in Jenner a kindred spirit. Jenner became Hunter's intimate friend despite the fact that he was by 20 years the younger man, and it was to Jenner, practising in Gloucestershire, that Hunter wrote from his "country" menagerie—it is significant of the spread of London that Hunter always alluded to Earl's Court as being in the country while it is now in the inner zone of the metropolis—outlining his doubts and asking for specimens to help him in their elucidation. In the Vicary Lecture delivered in Lincoln's Inn last February, during the Hunter bicentenary celebrations in London, Dr. Peachey gave some interesting extracts from Hunter's letters to Jenner, and as Baron's life of Jenner is now, I understand, difficult to obtain, I refer you to Peachey's lecture for the following quotation: Hunter keeps on asking for information as to the habits of the cuckoo and the breeding of toads, and continues: "If you collect eggs you should also collect the nests; I want a crow's nest, also a magpie's in the branches where they are built. I want a nest with the cuckoo's eggs in it, also one with a young cuckoo, also an old cuckoo. I hear you say there is no end to your wants." Again, he writes: "I thank you for your experiment on the hedgehog, try its heat and let me know the result. . . . You do not mention a word about bats. Have you got the bones yet of a large porpoise? Is ever the salmon spawn seen after she has parted with it? I will take any specimen of fossils you may send me, or indeed anything else. What do you think of examining eels? Their sexes have not yet been found out, nor their mode of propagation." In the spring of 1778 he was asking for more hedgehogs: "All that you sent me have died, so that I am hedgehog-less." And then in one letter, after referring to some amatory disappointment suffered by Jenner, he adds: "Let her go; never mind her. I shall employ you with hedgehogs." This random series of questions covers, it will be seen, a huge range of physiology, some of which later will have application in the actual practice of surgery. It is easy to see what fundamental possibilities for physiological research lie beneath the demand for information as to the temperature of the hedgehog. For the hedgehog is an animal which is for part of its life homothermal, maintaining a uniform body temperature, and for part of its life—namely, that spent in hibernisation—poikilothermal, having a variable body temperature corresponding to the environment. But how Jenner made the actual observations and how Hunter checked them with the kind of instrument that Fahrenheit had recently invented I cannot surmise, and I must not pose as a student of Hunter's original writings. He was, as you might expect from a man of no academic training, a bad and obscure writer, while his observations were largely made in scattered notes. It is quite possible that no notes on the matter exist; it is sadly probable that they were destroyed, for, it is well known that Sir Everard Home burnt a large quantity of his brother-in-law's manuscripts.

Now see where all this was tending and how it came about that Hunter while inventing comparative anatomy should also have become the father of modern surgery. All the questions in respect of propagation among fish, of vital processes among hibernisers, and of the domestic habits of birds point to the intention to find some common law of life by which the normal and the abnormal, as manifested in everything that lives, moves, and has its being might be interpreted. What we call physiology was in Hunter's days non-existent for the student. Hunter's lifelong and intense experience as a dissector and teacher of anatomy made him realise that every advance in his knowledge of structure ought to be associated with some fuller comprehension of function. Alterations in structure which he observed as regulated by the age, sex, or development of the subject, and equally so by morbid changes in the subject, ought, he felt, to be explained by some general laws of life. This collector of specimens, whose interest seemed directed with equal passion towards newts and buffaloes, eels and leopards, giants and dwarfs, was almost unconsciously working on a central plan, while his interrogatories to himself and to his friends were so heterogeneous and so apparently disconnected. He was acquiring a new knowledge of physiological processes as they occurred or might occur in man, by drawing upon the lessons derived from his persistent observation of similar processes in animal and sometimes vegetable life. The time came when he felt that some pattern of life was regulating his observations of structural, physiological, or pathological phenomena. This he alluded to as the vital principle, which he conceived of as being something, to use his own words, "superadded to matter, a property we do not understand; we can only see the necessary steps to it." In a sense we may be said at the present day to have advanced not much further than Hunter. What we have done is to follow Hunter's lines in the attempt to elucidate this "property that we do not understand." As we have advanced, difficulties

not conceived of by Hunter have arisen. His conceptions were entirely mechanistic, and it is now fairly universally admitted that mechanistic explanations are insufficient, the arena of dispute being the place at which something more than a mechanistic solution is called for.

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The rise from kail-yard peasant to world-famed philosopher; the life of piquant happenings; the self-infection with the disease whose pathology he expounded and whose sequelæ were fatal to him; the dramatic death within the walls of St. George's Hospital (the scene of his clinical triumphs); the holocaust made of his manuscripts by a trusted relative; the exhumation of his bones for burial in Westminster Abbey—all these things I know that you know of, and I have spared you their repetition, in order that I might ask you to regard this sensational figure in medical history as a child. But what a child! For he exercised his grand curiosity on the Maker of all things, demanding of Him, from the evidence supplied by His creations, what was the plan upon which He was working. Surely a Grand Curiosity.

JEJUNAL AND GASTRO-JEJUNAL ULCERS.

By ARTHUR F. HURST, M.D. Oxf., F.R.C.P. Lond.,
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AND
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PROFESSOR OF PATHOLOGY IN THE UNIVERSITY OF LEEDS.

I.* *Ætiology and Pathology.*

Frequency.—The frequency with which the operation of gastro-intestinal anastomosis is followed by peptic ulceration in the neighbourhood of the stoma depends chiefly on the nature of the disease for which the operation has been performed. Almost unknown after gastro-jejunostomy for cancer, and occurring but rarely in cases of simple gastric ulcer, jejunal ulcer is a frequent and dangerous sequel of gastro-jejunostomy for duodenal ulcer. The frequency, in short, varies directly with the hydrochloric acid content of the gastric juice, and is a measure of the ætiological importance of hyperchlorhydria in its production. Judd states that up to 1921 only one case of jejunal ulcer following resection of gastric carcinoma had been observed in the Mayo Clinic. The fact that patients with carcinoma of the stomach rarely survive the palliative operation of gastro-jejunostomy for any length of time no doubt partly accounts for this immunity, but it is equally certain that the diminished free hydrochloric acid content of the gastric juice, which is generally present, plays at least as important a part. In cases which survive gastrectomy the extensive resections carried out render the possibility of peptic action on the jejunal wall still more remote.

In cases of simple ulcer of the stomach, in which normal or subacid values are the rule, gastro-jejunostomy is rarely followed by jejunal ulcer. In a series of 10,300 post-mortems at Leeds there were 12 cases in which periods varying from six months to 18 years had elapsed since a gastro-jejunostomy had been performed for gastric ulcer; in none was jejunal ulcer present, but in three there was recurrent ulceration in the stomach. In the New Lodge Clinic series there was only one case of anastomotic ulcer following an operation for gastric ulcer. At the Mayo Clinic Balfour (1925) found that jejunal ulcer was 20 times more common after gastro-jejunostomy for duodenal ulcer than when the same operation had been performed for gastric ulcer. There is no doubt that the trivial incidence of jejunal ulcer reported in the earlier days of gastro-jejunostomy was partly due to the fact that most of the patients operated on at that time were the subjects of gastric ulcer or its sequelæ.

In duodenal ulcer, with its associated hyperchlorhydria, an anastomotic ulcer is a frequent complication of gastro-jejunostomy. The precise incidence is not easily determined. There is general agreement among surgeons that it is in the neighbourhood of 1 or 2 per cent. (Moynihan 1923, Judd 1921, von Eiselsberg 1914), but the method of computation on which most of their statistics are based is utterly fallacious. The much-quoted estimate of Balfour (1926) from the Mayo Clinic, for example, of 1·6 per cent. is arrived at by comparing the number of cases in which gastro-jejunostomy had been performed for simple lesions (8600) with the number of cases from the same group (139), which returned with an anastomotic ulcer. Some of the fallacies of this method have been indicated by Judd (1921), who suggests that in all probability the percentage is somewhat higher than the 1·3 per cent. which he gives, because in some instances the disturbance from the ulcer may not be sufficient to bring the patient back for treatment. A small ulcer is also very difficult or quite impossible to recognise on external examination, and many cases in which it is stated that nothing more than "adhesions" are found at operation are really examples of anastomotic ulcers. Moreover, with the return of symptoms the patient is likely to seek treatment elsewhere, so that the surgeon sees only a small proportion of his patients who develop the condition. Finally, in most of the surgical statistics cases are included which have been operated on only a year or two before, whereas the onset of anastomotic ulcer may be delayed for many years. If a series of cases of gastro-jejunostomy is followed over a long period, the number of anastomotic ulcers slowly but steadily increases, so that a final estimate of the incidence can only be reached after 15 or 20 years. Hohlbaum of Leipzig (1922), Bastianelli of Rome (1927), and Strauss, Bloch, and Friedman of Chicago (1928) are among the many surgeons in all parts of the world who now perform a more radical operation for duodenal ulcer, as they found an anastomotic ulcer developed after gastro-jejunostomy for this condition in 10, 24, and 25 per cent. of cases respectively. Very high incidence rates are given by Lewisohn (1925), who carried out a most painstaking "follow up." In a series of 68 cases re-examined four to nine years after gastro-jejunostomy 23, or 34 per cent., suffered from anastomotic ulceration, and Lewisohn advances strong reasons for supposing that this is more likely to be a minimal than a maximal figure.

In a consecutive series of 10,300 post-mortem examinations at Leeds there were 131 on whom the operation of gastro-jejunostomy had been performed for non-malignant lesions. In 46 death had occurred within ten days of the operation, and in none of these was there true jejunal or gastro-jejunal ulceration. In 41 cases the operation had been performed ten days to two months before death, and in this group there were two cases of acute jejunal and one of acute gastro-jejunal ulceration. In two cases, neither of which showed secondary ulceration, a period of two to six months had elapsed. Chief interest centres in the fourth group, numbering 42, where at least nine months had intervened. Here, no less than 22, or 52 per cent., were the seat of jejunal or gastro-jejunal ulceration or scarring (Table I.).

TABLE I.—*Analysis of 131 Cases of Gastro-jejunostomy for Simple Lesions of the Stomach and Duodenum coming to Autopsy.*

Group.	Period elapsing since operation.	No. of cases.	No. (and percentage) with jejunal or gastro-jejunal ulcers or scars.
1	0–10 days.	46	0
2	10 days–2 mths.	41	3 (7·3)
3	2–6 mths.	2	0
4	9 mths.–19 yrs.	42	22 (52·0)

A still more startling figure is obtained by further analysis of group 4. In 12 cases the original operation was for gastric ulcer, and in three of these there was recurrent ulcer in the stomach. All the 22 cases of jejunal ulceration or scarring occurred in the 30 cases of duodenal ulcer, an incidence of 73 per cent. Obviously this is no criterion of the frequency with which gastro-jejunostomy for duodenal ulcer is followed by ulcerative lesions of the stoma or jejunum, but it suggests that the true incidence is much higher than the 1 or 2 per cent. claimed by most surgeons.

During a period in which 36 patients with gastric ulcer and 137 with duodenal ulcer were seen at New Lodge Clinic, no less than 43 cases of gastro-jejunal and jejunal ulcer came under observation, the operation in every case having been performed elsewhere (Evans Jones).

It is interesting to observe how the reported incidence of jejunal ulcer has increased in the last few years. Thus Paterson, writing in 1909 (*b*), when he was able to collect 65 published cases, stated that no instance of ulcer following the posterior no-loop operation had been recorded! Two years earlier

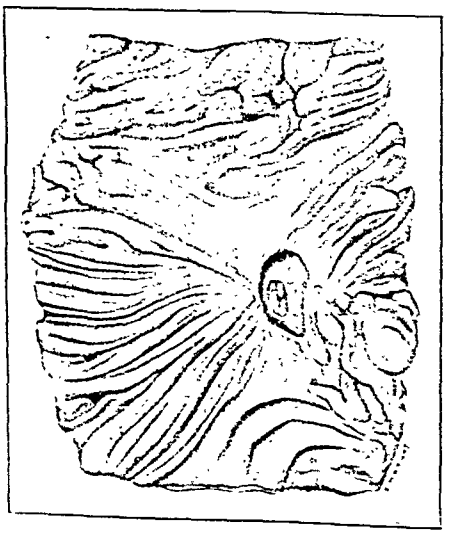
* Part II. will appear next week.

W. J. and C. H. Mayo, Murphy, and other leading American surgeons had informed him that they had yet to see a case. Ten years later Garnett Wright collected 142 published cases; in 1925 Judd reported 101 cases from the Mayo Clinic alone, and in 1926 Balfour added 38 more from the same source. It is clear that this cannot be wholly accounted for by the increasing frequency with which gastro-jejunostomy is performed nowadays. Two other important factors are at work: (1) the increasing use of the operation in the treatment of duodenal ulcer and its diminishing use in cases of gastric ulcer; and (2) the passage of time, by which cases of ulcer developing 8, 10, and 15 years after operation are now coming under observation.

Although the large majority of anastomotic ulcers follow a gastro-jejunostomy, they may also develop after every variety of partial gastrectomy. Birgfeld in 1925 collected 67 cases from the German literature, and we have seen reports of 14 cases published since that date in which an anastomotic ulcer followed partial gastrectomy. Among the New Lodge Clinic series there was one case in which an anastomotic ulcer was found four years after removal of the greater part of the stomach for a jejunal and a gastric ulcer, the sequelæ of a gastro-jejunostomy performed four years earlier for a duodenal ulcer, and two others in which one developed after partial gastrectomy for a gastro-jejunal ulcer.

Age-incidence.—Anastomotic ulcers are most common in middle life, the period when gastro-jejunostomy is most frequently performed, the great majority of

FIG. 1.



Jejunal ulcer. The patient, a man of 48, had had posterior gastro-jejunostomy performed four years before admission to hospital. Pain in the umbilical region had been present for six months, and five weeks before admission he had had a severe attack of hæmatemesis and melæna. X ray examination showed that the stomach emptied slowly, chiefly through the pylorus, but there was no holding up in the jejunum. At operation the loop of jejunum containing the ulcer was excised, together with the stoma. There is a chronic, penetrating jejunal ulcer just opposite the stoma. Perforation had been prevented by a pad of fibrosed fat in the floor of the ulcer. (Figs. 1 to 4 are two-thirds natural size.)

the cases occurring between the ages of 30 and 50. In the Leeds autopsy series (22 cases) the youngest was 27 and the oldest 57 when symptoms began, while the ages at death ranged from 28 to 59; the average age at the onset of symptoms in 10 cases of gastro-jejunal ulcer was 41·2 years and in 12 cases of jejunal ulcer 43·2 years. In Wright's (1918–19) collected series the youngest was 2 months and oldest 81.

Sex-incidence.—In view of the intimate relation between duodenal and anastomotic ulcer it is not surprising that the latter should show a striking preponderance in males. In 110 cases of active ulceration collected by Wright 113 were males and 27 females. All of our autopsy series of 22 cases were males. In the Mayo Clinic cases (Judd, 1921) there were 90 males and 11 females, although gastro-

FIG. 2.

Gastro-jejunal ulcer from a male aged 39. Six years before he had had a chronic duodenal ulcer infolded and sutured, followed two years later by posterior gastro-jejunostomy. He remained well for three years, but during the past year he had had attacks of severe epigastric pain after food. Radiographic examination showed an ulcer corner close to the stoma. Partial gastrectomy. The ulcer is situated on the posterior wall of the stomach, its inferior margin abutting on the line of anastomosis.

jejunostomy was performed only three and a half times as often in men as in women. In the New Lodge Clinic series of 43 patients there were 37 men and 6 women. In 92 per cent. of the 67 cases following partial gastrectomy collected by Birgfeld the patients were men.

For some unexplained reason a gastro-jejuno-colic fistula has never been observed in a woman, but out of 31 cases of perforation collected by Mastle (1924) as many as seven were females.

Profession.—In the New Lodge Clinic series 9 out of 37 male cases, or 25 per cent., were doctors, compared with 16·5 per cent. of the male duodenal ulcer cases and 7·7 per cent. of the male gastric ulcers. When these figures are compared with the incidence of doctors among the total admissions to the Clinic, excluding ulcers—12·5 per cent.—the proportion of anastomotic ulcers among doctors is remarkably high. This does not seem to be entirely due to the high incidence of duodenal ulcer, but is rather the result of the tendency of doctors to undergo operation without giving medical treatment a fair chance; this is well seen in Hospital insurance statistics, which show that the number of doctors who undergo medical and surgical treatment respectively is about equal.

Family History.—The tendency of duodenal ulcer to occur in families has been discussed by one of us (A. F. H., 1921) in a previous paper. The frequency of a family history is still more commonly obtained in patients with gastro-jejunal and jejunal ulcers. In 6 out of the New Lodge Clinic series of 43 cases there was a clear history of duodenal ulcer in 2, 2, 3, 3, 3, and 5 near relations respectively (vide Charts I. and II.). In 2 or perhaps 3 of these another member of the family had had a jejunal ulcer as well.

Site.—Peptic ulcer occurring in relation to a gastro-jejunal anastomosis is termed jejunal when it is definitely within the jejunum and separated from the line of anastomosis by a band, however narrow, of more or less healthy mucous membrane, which occur in the line of anastomosis or which

JEJUNAL AND GASTRO-JEJUNAL ULCERS.

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I.* *Ætiology and Pathology.*

Frequency.—The frequency with which the operation of gastro-intestinal anastomosis is followed by peptic ulceration in the neighbourhood of the stom depends chiefly on the nature of the disease for whi the operation has been performed. Almost unkno after gastro-jejunostomy for cancer, and occur but rarely in cases of simple gastric ulcer, je ulcer is a frequent and dangerous sequel of jejunostomy for duodenal ulcer. The fr in short, varies directly with the hydroc content of the gastric juice, and is a me ætiological importance of hyperchlor production. Judd states that up one case of jejunal ulcer following r carcinoma had been observed in The fact that patients with carci rarely survive the palliative jejunostomy for any length accounts for this immunity that the diminished free of the gastric juice, whi at least as important gastrectomy the e render the possibil wall still more re

In cases of si normal or s jejunostomy a series of 12 cases to 18 y had be jejuna ulcer seri foll Cl 2

examination, and m that nothing more operation are rea Moreover, with is likely to s surgeon sees who develo surgica op

exact lin cases may ship of an ul

Unabsorbable infrequently cut in so doing may bec matory and ulcerative especially when used for coats, sutures remain buried indefinite number of years. Many they are an important factor in the a jejunal ulceration and have given up except for the outer suture; others throughout. It is certainly true that we h infrequently come across cases in which portio silk or linen thread were found hanging into the from the anastomotic site, but as a rule this has been unaccompanied by true jejunal or gastro-jejunal ulceration. The tendency on the whole has been to stress unduly the importance of this factor. Judd found non-absorbable sutures still present in the ulcer in 9 out of 55 cases (16·25 per cent.) which had originally been operated upon in the Mayo Clinic, but in 17 out of 46 cases (37·77 per cent.) where gastro-jejunostomy had been done elsewhere. On the other hand, a case of Sistrunk's is quoted in which, without any ulcer, heavy black silk sutures were found hanging from the stoma after 12 years. Moynihan (1925) also mentions having seen two cases of this kind. Walton (1925) found a portion of suture in the base of the ulcer in no fewer than 9 of his 20 cases.

There is little evidence to show that the use of catgut only has had any appreciable effect in lowering the incidence of secondary ulcer. Lewisohn (1925) believes that the kind of material used is of little moment. In 21 cases which he reported in 1921 no remnant of suture material was found, although in most of them Pagenstecher's linen thread had been used for the outer layer. Catgut itself is not always rapidly absorbed and may remain embedded in the tissues for many months, often giving rise to a mild grade of inflammatory reaction in its immediate neighbourhood.

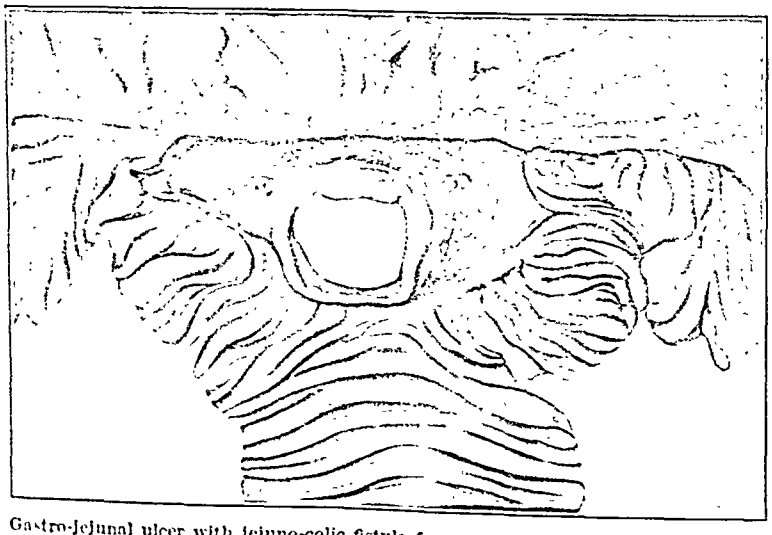
Healing.—It is clear from post-mortem observations that the spontaneous healing of jejunal ulcer, at least of the chronic variety, is a comparatively rare event, much more so than the healing of chronic gastric or duodenal ulcer. In our series of 22 post-mortem cases two only, one jejunal and one gastro-jejunal, had healed without either further operative interference or the development of a jejuno-colic fistula. On the other hand, out of the 35 cases in the New Lodge Clinic series, 25 of which were treated medically, 13 recovered more or less completely without operation. Healing is sometimes greatly facilitated by the performance of a second gastro-jejunostomy, but this on is so often followed by fresh ulceration in to the new stoma, when the last state may be than the first, that it is doubtful whether it ever to be performed. In cases of jejuno-colic also there is usually rapid healing of the open a fact which again emphasises the importance digestion as a factor in the continuance of ative process, as the free acid still present in h before the fistula develops is likely to be or less completely neutralised by the regurgita- the contents of the colon. In the Leeds series

of five cases of jejuno-colic fistula which came to autopsy without a secondary operation three were completely healed and two were still the seat of open ulceration (Fig. 3).

There is much evidence to support the view that many cases of jejuno-colic fistula are due to the adhesion and perforation of *acute* jejunal ulcers. This may partly explain the readiness with which healing of the ulcer takes place once continuity between jejunum and transverse colon has been established. The mere presence of a jejuno-colic fistula in an old gastro-jejunostomy case, whether active ulceration can be detected or not, is, of course, sufficient proof that jejunal ulceration has existed. A fistula from an acute ulcer which has healed will show no obvious scarring to the naked eye. As in the stomach the scars of chronic ulcers are usually easily detected (Fig. 4.)

For reasons already stated the healing of a true jejunal ulcer is little likely to be accompanied by cicatricial stenosis unless it is of unusually large size and great chronicity. If, however, a chronic ulcer is situated directly opposite the stoma it may, by contraction of its base, produce a spur-like projection in the jejunal loop capable of giving rise to obstruction (Moynihan, 1912). Such an obstruction or one arising within the efferent limb may lead to hypertrophy and dilatation of the afferent limb. Gastro-jejunal ulcers, on the other hand, by virtue of their position as well as their frequent chronicity, are very liable indeed to produce narrowing of the stoma (Fig. 4). Under favourable circumstances, such as the making of a second anastomosis or the spontaneous reopening of a partially stenosed or reflexly narrowed pyloric canal, the cicatrisation and narrowing may be extreme and even lead to complete closure. Stenosis of greater or less severity may result from ulcers which are still active in consequence of the contraction of the fibrous tissue in their floor. Gastro-jejunal ulcer thus falls into line with those ulcers of the stomach and duodenum which lead to cicatricial deformity, and which may or may not be completely healed at the time of operation or autopsy.

FIG. 3.



Gastro-jejunal ulcer with jejuno-colic fistula from a man of 48. In 1923 posterior gastro-jejunostomy was performed for chronic duodenal ulcer with symptoms of long standing. He remained well until April, 1927, when persistent diarrhœa commenced, the bowels moving as often as 15 times a day. He had not vomited, and the appetite remained good, but there was a loss of 2 stones in weight. On one occasion only there was a remission of the diarrhœa for about a fortnight. He was admitted to hospital in December, 1927, with general peritonitis, apparently due to leakage through the floor of the ulcer. The stomach and jejunum as well as the gastro-jejunostomy have been laid open and the specimen is viewed from behind. The line of anastomosis runs almost transversely across the upper third of the picture. Abutting on it from below is a very large, roughly triangular, chronic gastro-jejunal ulcer, with a wide fistulous opening into the transverse colon near the centre. A regular cuff of colonic mucosa, surrounding the aperture, projects into the jejunum.

It was formerly believed that if, as a result of this short-circuiting operation, the patency of the pylorus and duodenum should become restored, and the stomach contents resume their normal route, the gastro-jejunal stoma might undergo a narrowing process from simple disuse. It cannot be too strongly emphasised that jejunal and gastro-jejunal stenosis is invariably the product of peptic ulceration.

FIG. 4.

Gastro-jejunal scar, with extreme stenosis of stoma (shown below). Near the centre of the irregular area of scarring there is a small circular area of re-ulceration. Male, aged 49. First posterior gastro-jejunostomy in 1907, second in 1917. Death occurred in 1925 and was due to the perforation of a second jejunal ulcer in relation to the second gastro-jejunostomy.

Recurrent Ulceration.—It is obvious from what has already been said that the treatment of a case of jejunal ulcer by further operative measures of a conservative kind is likely to be followed by further ulceration. If a jejunal ulcer is treated by simple excision a fresh jejunal ulcer may develop at a later date at the same or some other point. If in addition the gastro-jejunal stoma is closed, fresh gastric or duodenal ulceration may result. Many cases of both kinds are now on record. One or other form of recurrence occurred in 6 out of 22 in the Leeds post-mortem series (27 per cent.) and in 9 out of 44 cases in the New Lodge clinical series (20 per cent.).

(1) *Recurrent Jejunal Ulcer.*—In the Leeds series a recurrent jejunal ulcer developed in three after a second gastro-jejunostomy, and in one after excision of the first ulcer. The interval between the first and second operation was 9, 13, 7, and 10 years respectively, the interval between the second operation and death being 9 years, 8 months, 4 years, and 8 years.

One of these cases (Thompson and Stewart, 1927–28) is of special interest on account of the repeated peptic ulceration from which this patient suffered. Originally the subject of chronic duodenal ulcer of many years' standing, he submitted himself in the course of 16 years to no fewer than five distinct operations, two posterior and two anterior gastro-jejunostomies, and a partial gastrectomy. The original duodenal ulceration and subsequent jejunal ulceration in relation to the two posterior gastro-jejunal stomata cicatrised completely in turn, while a third jejunal ulcer in relation to the third stoma was present at the time of the partial gastrectomy. The patient survived the last operation two years and one month, when he died of chronic nephritis and arteriosclerosis. At autopsy two subacute ulcers were found in the small remaining portion of the stomach.

The following eight cases of recurrent gastro-jejunal or jejunal ulcer occurred in the New Lodge series of 44 anastomotic ulcers.

CASE 1.—M. 1900: aged 16, symptoms began. 1915: gastro-jejunostomy performed two days after an attack of melæna. 1917: entero-anastomosis between the jejunal loops on account of recurring attacks of melæna: a gastro-jejunal ulcer was found. 1920: laparotomy for recurrent hæmorrhage, but nothing found. 1922 and 1926: New Lodge Clinic. Recurrent hæmorrhage continued, but would not consent to further operation. December, 1927: very well since June, 1926, except for three small hæmorrhages in spring of 1927.

CASE 2.—M. 1906: aged 24, symptoms began; no hæmorrhage. 1911: gastro-jejunostomy. Pain worse.

on it, whether principally gastric or principally jejunal, are termed gastro-jejunal. Ulceration is about equally common in the two sites. In a series of 129 cases collected by Wright (1918–19) 66 were jejunal and 63 gastro-jejunal. Of 22 cases examined in the post-mortem room at Leeds under the most favourable conditions for investigating this point, 12 were jejunal and 10 gastro-jejunal. At operation, unless the affected tissues are excised, it may be impossible to say definitely which type of lesion is present.

Conventionally we shall use "anastomotic" as the inclusive term, as both gastro-jejunal and jejunal ulcers are sequels of an anastomotic operation, "gastro-jejunal" and "jejunal" being used solely in the restricted sense.

True jejunal ulcer occurs most frequently in the efferent limb of the jejunal loop (Fig. 1), occasionally directly opposite the stoma, and only very rarely in the afferent limb where the alkaline juices from the duodenum are able to exert an inhibitory influence. Most true jejunal ulcers occur within an inch of the anastomosis, rarely at a distance of several inches.

Gastro-jejunal ulcer, while always implicating the actual stoma, is usually situated mainly on one or other side of it, often stopping short precisely at the line of anastomosis (Figs. 2 and 3). In contradistinction to this is the strict limitation of immediately post-operative sloughing and ulceration to the actual anastomotic line. The latter is probably an invariable occurrence during the first week or ten days after gastro-jejunostomy, in cases where, owing to interference with the mucosal circulation, healing by first intention fails to take place. Even under these circumstances healing is only slightly delayed (Flint, 1917), and there is no evidence to suggest that the sloughing process is followed by true gastro-jejunal ulceration.

Number.—Both jejunal and gastro-jejunal ulcers are usually single. In Wright's collected series of 142 cases all but 9, and in our series of 25 autopsy cases all but 3 had single ulcers. In Leveuf's (1927) collected series of 34 cases of perforated ulcer 26 (8 gastro-jejunal and 18 jejunal) were single and 8 multiple; 5 of the latter group were gastro-jejunal and 3 jejunal, the ulcers numbering 4 in one case and 2 in all the others. In the Leeds series the numbers present in the 3 multiple cases were 2, 3, and 4 respectively.

As in the stomach multiple ulcers are nearly always acute, although occasionally one of them is chronic. Solitary acute ulcer, on the other hand, appears to be relatively more common in the jejunum than in either stomach or duodenum.

Morbid Anatomy.—Jejunal ulcers resemble in all essential respects the more usually situated lesions. They may be acute, subacute or chronic, according to the length of time they have been in existence, and their naked-eye and microscopic characters correspond, *mutatis mutandis*, with ulcers of the stomach and duodenum. They differ from the latter, however, in the important respect that a larger proportion, especially of true jejunal ulcers, give rise to serious trouble while still in the acute or subacute stage. In the jejunum they are usually round or oval (Fig. 1), but large, acute ulcers opposite the stoma are sometimes triangular or polygonal. Gastro-jejunal ulcers, as already mentioned, are often bounded above or below as the case may be, by the anastomotic suture-line, which causes them to assume a rather irregular shape (Figs. 2 and 3). In Judd's (1921) series there were 30 large and 42 small ulcers, 6 being hard and 10 calloused.

In their natural history also they follow gastric precedent. They may heal, perforate, or erode blood-vessels, and they often become adherent to surrounding structures. Extensive and dense adhesions may occur in either variety, but are much more constant in cases of gastro-jejunal ulcer. In Judd's series of 101 cases adhesions of variable degree were present in 54. True jejunal ulcers resemble in many respects ulcers of the anterior duodenal wall. In each case they are situated in a thin-walled, practically unsupported viscus, which accounts for the frequency of perforation and for the infrequency of very large or very chronic lesions. It follows from this that they rarely lead to cicatricial stenosis. Gastro-jejunal ulcers, on the other hand, tend to chronicity and are a frequent cause of mechanical obstruction.

In the healing of the operative (gastro-jejunal) anastomosis, there occurs a definite hypertrophy of the muscularis mucosæ just beneath the line of apposition of the two mucous membranes. A considerable nodule of unstriped muscle may be formed in this way, possibly with the aid of some fibres from the underlying muscularis, and the condition is comparable with what sometimes occurs in the healing of gastric ulcer. If it has not been encroached on by fresh ulceration, it serves as an additional guide to the exact line of junction of the two organs, and in some cases may even help to determine the exact relationship of an ulcer to the stoma.

Unabsorbable materials, silk and linen thread, not infrequently cut out into the lumen of the gut, and in so doing may become associated with local inflammatory and ulcerative disturbances. In other cases, especially when used for the muscular and serosal coats, sutures remain buried in the tissues for an indefinite number of years. Many surgeons hold that they are an important factor in the ætiology of gastro-jejunal ulceration and have given up using them except for the outer suture; others use catgut throughout. It is certainly true that we have not infrequently come across cases in which portions of silk or linen thread were found hanging into the gut from the anastomotic site, but as a rule this has been unaccompanied by true jejunal or gastro-jejunal ulceration. The tendency on the whole has been to stress unduly the importance of this factor. Judd found non-absorbable sutures still present in the ulcer in 9 out of 55 cases (16·25 per cent.) which had originally been operated upon in the Mayo Clinic, but in 17 out of 46 cases (37·77 per cent.) where gastro-jejunostomy had been done elsewhere. On the other hand, a case of Sistrunk's is quoted in which, without any ulcer, heavy black silk sutures were found hanging from the stoma after 12 years. Moynihan (1925) also mentions having seen two cases of this kind. Walton (1925) found a portion of suture in the base of the ulcer in no fewer than 9 of his 20 cases.

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ulcer. A test-meal showed hyperchlorhydria, hypersecretion, and delayed evacuation, 45 c.cm. of starch-containing material with 0·182 per cent. free HCl being removed at the end of three hours. The pain and occult blood in the stools disappeared with medical treatment, and three months later he was still quite well.

(2) *Recurrent Ulceration in Duodenum of Stomach.*—In the Leeds post-mortem series a fresh ulcer appeared in the duodenum in one case and close to the cardiac orifice of the stomach in another, after a gastro-jejunostomy had been undone on account of jejunal ulcer. In two cases of the New Lodge Clinic series in which a gastro-jejunal ulcer was excised and the parts restored to their normal anatomy, a new duodenal ulcer developed as a result of a dietetic indiscretion; in one of them an earlier jejunal ulcer had previously been excised (Case 5 above). In both cases the duodenal ulcer healed with medical treatment. In another case a gastro-duodenostomy was performed at the same time as the gastro-jejunostomy was undone after excising a gastro-jejunal ulcer; a gastric ulcer developed soon afterwards and death eventually occurred as a result of its perforation.

CHART III.

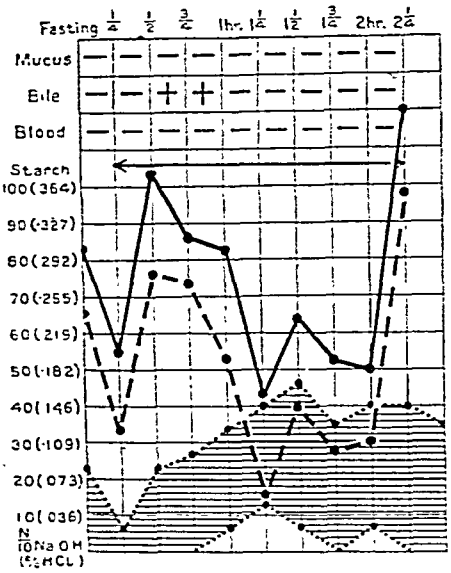


CHART IV.

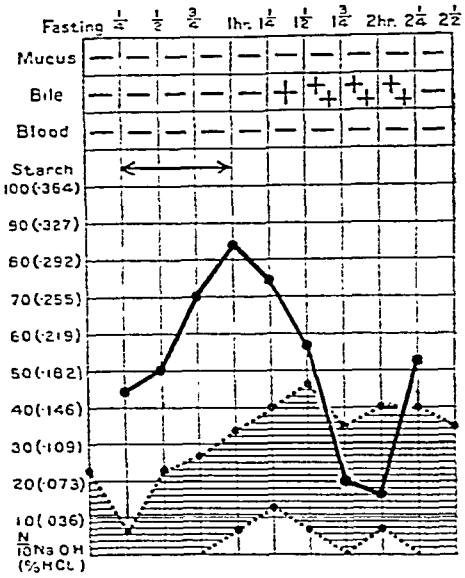
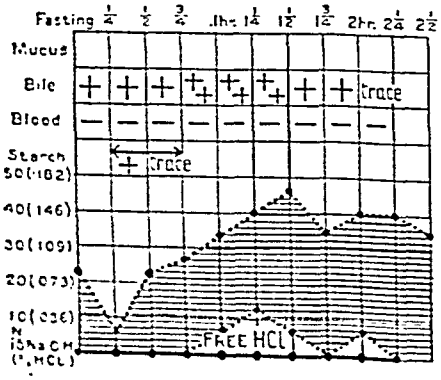


CHART III.—Male. Duodenal ulcer symptoms began at age of 18 in 1903; gastro-jejunostomy 1923; pain recurred 1924; hæmorrhage from gastro-jejunal ulcer 1925. Test-meal (1925) showed hyperchlorhydria and hypersecretion with 75 c.cm. of very acid resting juice, rather slow evacuation, and a little bile in two fractions only.

CHART IV.—Curve of free HCl nine years after gastro-jejunostomy for duodenal ulcer. No symptoms, but hyperchlorhydria persists and entry of duodenal contents is deficient (J. J. Conybeare).

Pathogenesis.—The factors concerned in the production of gastro-jejunal and jejunal ulcers are the same as those upon which the development of primary gastric and duodenal ulcers depend. The presence of free hydrochloricacid and infection are the essentialfactors. In a few cases an area of diminished resistance is present owing to hæmorrhage caused by puncture of a vessel or bruising from the use of a clamp, or to the delay in healing which may result from the use of unabsorbable sutures. Excessive smoking, mental and physical fatigue, dietetic errors, incidental infections such as tonsillitis and influenza, and conditions which give rise to vasomotor disturbances, such as exposure to rapid changes in temperature, are accessory factors as in simple gastric and duodenal ulcer. These accessory factors may be partly responsible for the high incidence of anastomotic ulcers amongst doctors.

CHART V.



Fractional test-meal nine years after gastro-jejunostomy for ulcer on lesser curvature. No symptoms except distension after meals. Complete achlorhydria and very rapid evacuation. X rays shows that all food passes out of stoma and none through pylorus (J. J. Conybeare).

(*a*) *The Acid Factor.*—Simple ulcers only occur under natural conditions in the stomach and first part of the duodenum because free hydrochloric acid is never present anywhere else, but after the performance of a gastro-jejunostomy the first few inches of the efferent limb of the jejunum may also come in contact with the acid secretion of the stomach. The importance of the acid factor is shown by the fact that free hydrochloric acid is probably always present in the gastric contents of patients with gastro-jejunal and jejunal ulcers (Charts I., II., III., and VI.), and in most cases there is actually hyperchlorhydria and hypersecretion. The frequency of their development varies according to the condition for which the gastro-jejunostomy was performed. Thus they very rarely occur after gastro-jejunostomy for malignant disease, although the poor general condition of the patient might be expected to predispose to the formation of an ulcer. This immunity is probably due to the complete absence of free hydrochloric acid in 65 per cent. of cases of carcinoma of the stomach, and the hypochlorhydria in the majority of the remaining 40 per cent., so that free acid could very rarely be present after gastro-jejunostomy.

Conybeare has shown by fractional test-meals that the curve obtained in cases in which the operation had been performed for duodenal ulcer (Chart IV.) is similar to, though slightly lower than, that characteristic of duodenal ulcer before operation. On the other hand, in cases of gastric ulcer hypochlorhydria and often complete achlorhydria are present after operation (Chart V.). The results are the same whether any symptoms are present or not after the gastro-jejunostomy. They indicate that the addition of the alkaline bile, pancreatic juice, and duodenal secretion, which enter the stomach by the afferent limb of the jejunum, is insufficient to overcome the hyperchlorhydria which occurs in patients who are liable to duodenal ulcer; for this is independent of the actual presence of an ulcer, and is therefore as well marked after an ulcer has healed as a result of medical or surgical treatment as before. But the addition of these alkaline fluids is sufficient to neutralise more

1912: appendicectomy and "repair of gastro-jejunal stoma." Pain worse; hæmatemesis and melæna. 1913: gastro-jejunal ulcer excised, gastro-jejunostomy closed and a new one made on advice of A. F. H. 1922: New Lodge Clinic; no return of ulcer symptoms, but fæcolith in colon. December, 1927: no return of ulceration. Recurrent formation of fæcoliths.

CASE 3.—M. 1914: aged 31, symptoms began; no hæmorrhage. 1915: gastro-jejunostomy for duodenal ulcer. 1917: symptoms returned with hæmatemesis. 1919: partial duodenectomy and almost complete gastrectomy for jejunal and gastric ulcers; the original duodenal ulcer had healed. Relief three and a half years. 1923: New Lodge Clinic; pain and melæna from jejunal ulcer.

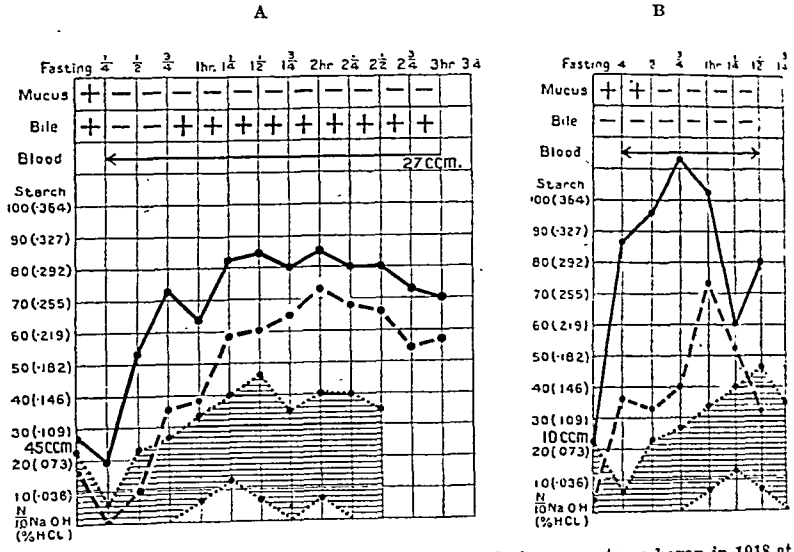
CASE 4.—M. 1915: aged 26, symptoms began. 1916: gastro-jejunostomy; pain returned in 1917. 1924: excision of callous gastro-jejunal ulcer, and new gastro-jejunostomy made. Relief one and a half years. Pain and hæmorrhage then recurred. December, 1926: New Lodge Clinic; a jejunal ulcer, which had almost perforated into the transverse colon, was excised and normal anatomy restored. December, 1927: very well.

CASE 5.—M. 1918: aged 23, symptoms began; no hæmorrhage. 1919: gastro-jejunostomy. Excision of gastro-jejunal ulcer. Relief one year. 1921: pain returned with melæna. March, 1926: having developed another gastro-jejunal ulcer, which had nearly perforated the transverse colon, this was excised and the parts returned to their normal relationship at the Clinic. He remained perfectly well until December, 1927, when a duodenal ulcer developed as a result of a dietetic indiscretion. He soon recovered with medical treatment. (Chart I.)

CASE 6.—M. 1909: aged 23, symptoms began; no hæmorrhage. 1915: gastro-jejunostomy for "pyloric ulcer"; appendicectomy. 1924: recurrence of symptoms with hæmatemesis; partial gastrectomy. 1925: recurrence of symptoms with hæmatemesis. 1928: New Lodge Clinic; gastro-jejunal ulcer. Apparent recovery with medical treatment.

CASE 7.—M. 1915: aged 29; gastro-jejunostomy for "pyloric ulcer" and appendicostomy without previous medical treatment; a four years' history of intermittent dyspepsia. 1924: partial gastrectomy on account of hæmatemesis after nine years of freedom from symptoms. Hæmatemesis recurred in 1925, 1926, and 1927. 1928: New Lodge Clinic with typical symptoms of gastro-jejunal ulcer, which disappeared with medical treatment.

CHART I.



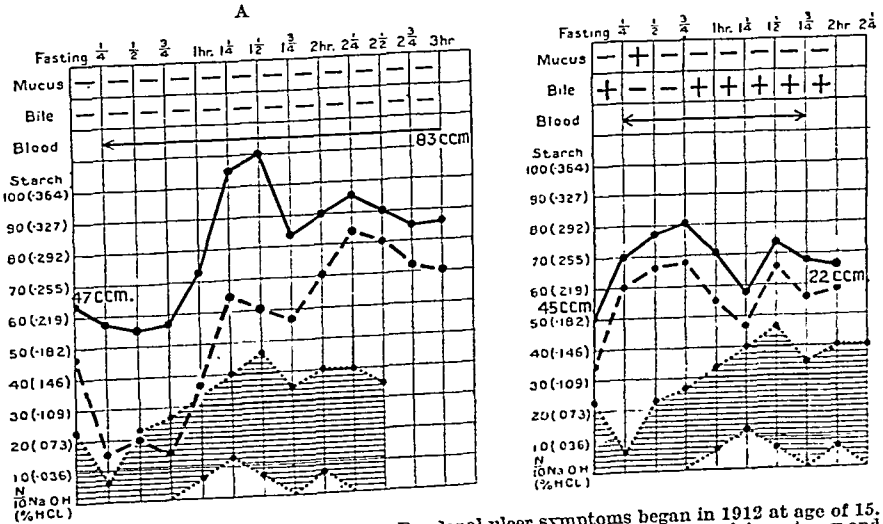
Patient X, male, brother of Y (Chart II.). Duodenal ulcer symptoms began in 1918 at age of 23. Gastro-jejunostomy 1919. Pain returned in six months; several hæmorrhages. 1921: jejunal ulcer excised, stoma closed, new gastro-jejunostomy made. 1922: severe recurrence. Ulcer excised and stoma closed at New Lodge Clinic, April 23rd, 1926. Recurrence duodenal ulcer December, 1927. Curve (A) shows hyperchlorhydria, hypersecretion, and delayed evacuation with jejunal ulcer; curve (B) shows more marked hyperchlorhydria with normal evacuation after gastro-jejunostomy undone. Except in Charts IV. and V., continuous line is total acidity and dotted line free HCl.

CASE 8.—F. April, 1912: aged 21, gastro-jejunostomy three weeks after hæmatemesis, said to have been from a gastric ulcer. August, 1912: partial gastrectomy as constant pain since April. October, 1912: appendicectomy. 1914: hysterectomy. 1928: New Lodge Clinic for constant abdominal symptoms since 1912. Gastro-jejunal ulcer, which yielded to medical treatment, and band of adhesions involving pelvic colon, which were dealt with surgically.

A remarkable case of recurrent ulceration came under our observation at Guy's Hospital in November, 1927.

A man of 58 developed symptoms of duodenal ulcer in 1906 and a gastro-jejunostomy was performed for it in 1909. He remained perfectly well till 1923, when pain returned, exactly similar to that which he had had at first. In 1924 he was operated upon for perforation of a duodenal ulcer; this was sutured. The pain returned directly after his discharge from hospital and in 1926 perforation occurred again, but this time it was a jejunal ulcer. The perforation was sutured, and the pain returned at once and continued until his admission to Guy's. The pain was now characteristic of duodenal and not jejunal ulcer, with rigidity and tenderness over the duodenum, the bulb of which was seen with the X rays to be deformed; there was also tenderness over the stoma, so presumably he had both a duodenal and a gastro-jejunal

CHART II.



Patient Y, male, brother of X (Chart I.). Duodenal ulcer symptoms began in 1912 at age of 15. Being associated with chronic duodenal ileus causing gastric stasis, duodeno-jejunostomy and gastro-jejunostomy performed at New Lodge Clinic on June 30th, 1927. No return of symptoms (March 1st, 1928). Curve (A) shows hyperchlorhydria, hypersecretion, and delayed evacuation before operation. Curve (B), three months after operation, shows normal evacuation and more marked hyperchlorhydria in spite of presence of bile in most fractions.

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or less completely the less acid gastric juice of the majority of patients who develop gastric ulcer. Corresponding with this, gastro-jejunal ulcers are very much more common after a gastro-jejunostomy performed for a duodenal ulcer than after one performed for a gastric ulcer, even when the latter has led to pyloric obstruction and hypersecretion, as the hypersecretion is secondary to the obstruction and disappears when it is overcome by short-circuiting.

In several cases in which a gastro-jejunostomy was undone at the same time as a jejunal ulcer was excised, we have been struck by the exceptionally high curve of acidity present after the second operation, indicating that an extreme degree of the hypersthenic gastric diathesis may be a predisposing cause of jejunal ulcer (Charts I. (A) and (B)). This would also explain the tendency for a second anastomotic ulcer to develop after one has been excised and a new gastro-jejunostomy performed. The influence of the hypersthenic gastric diathesis is no doubt also the explanation of the familial occurrence of anastomotic ulcers.

In some cases the presence of hyperchlorhydria after gastro-jejunostomy is due to errors in technique. Thus any obstruction at or near the stoma, which hinders the flow of the alkaline fluids from the duodenum into the stomach, or an opening which is too small or is badly placed for effective drainage, so that delayed evacuation and hypersecretion occur (Charts I. and II.) is likely to be followed by jejunal ulceration. In some of our cases there was an excess of bile in the stomach, but insufficient to overcome the hyperacidity. This was probably due to the exit of chyme into or along the jejunum being obstructed, so that it accumulated in the stomach and was only incompletely neutralised by the alkaline juices coming from the duodenum.

The experiments of Mann and Williamson (1923) on dogs confirm these views as to the pathogenesis of jejunal ulcers. They divided the pylorus and first part of the jejunum. After closing the distal end of the divided pylorus they anastomosed the proximal end with the distal end of the jejunum and the proximal end of the jejunum with the ileum, so that all the alkaline bile, pancreatic juice, and duodenal secretion flowed into the ileum, whilst the acid gastric contents entered the jejunum. A typical chronic ulcer almost invariably developed in the jejunum, and many of the ulcers perforated. They promptly healed if the normal gastro-intestinal tract was re-established.

The presence of free hydrochloric acid is not by itself capable of giving rise to a gastro-jejunal or jejunal ulcer, as free acid is almost invariably found after gastro-jejunostomy performed for duodenal ulcer, even when the result is entirely satisfactory (Chart V.). Some other factor must therefore always be present. The exciting cause of the ulcer is probably the same in most cases as that of the original gastric or duodenal ulcer for which the operation was performed. It is not surprising that a secondary ulcer should occur when free hydrochloric acid is still present if this cause has not been removed.

(b) *The Infective Factor.*—The most important exciting cause of gastro-jejunal and jejunal ulcer is the presence of infective foci in connexion with the teeth, pharynx, nasal sinuses, appendix, or gall-bladder. Complete dental reports are still available in 36 of the New Lodge Clinic series; more or less widespread pyorrhœa alveolaris was present alone in 20, apical dental infection alone in 2, and both together in 6; 6 were edentulous, and only two had normal teeth. In four cases a diseased appendix was removed after the development of the anastomotic ulcer, but without causing it to heal, as the ulcer was still active when the patient was subsequently admitted into the clinic.

Gordon Taylor observed a case in which a jejunal ulcer perforated as a direct sequel of an attack of acute appendicitis. It is also possible that infection may occur from a chronic gastric or duodenal ulcer which has not healed. Bohmansson (1926) has recently drawn attention to the possible influence of gastritis in the development of gastro-jejunal ulcers, as the investigations of Konjetzny and others have shown how frequently gastritis is associated with gastric and duodenal ulcer. An anastomosis made between the inflamed mucous membrane of the stomach and the healthy mucous membrane of the jejunum is likely to heal incompletely and form the basis of a gastro-jejunal ulcer. This is one reason why many continental surgeons now prefer to perform partial gastrectomy even for a small duodenal ulcer, as by this operation they remove all or the greater part of the area involved in the gastritis, which they regard as an important factor in the pathogenesis of the primary ulcer. We believe that the importance of this factor has been exaggerated, but the almost constant presence of active gastritis in fresh specimens obtained when partial gastrectomy is performed for simple gastric and duodenal ulcer shows the necessity of giving a preliminary course of medical treatment before any operation is undertaken. If at the same time all foci of infection in the mouth and naso-pharynx are eradicated, it is very improbable that any active inflammation would be present when the gastro-jejunostomy or partial gastrectomy is performed.

Mann and Rosenow found that the jejunal ulcers produced in dogs by the operation already described always showed evidence of streptococcal infection. Immunisation of one animal with streptococci from an experimental ulcer of this kind in another animal prevented the development of an ulcer in the former after the performance of the operation.

SPLENOMEDULLARY LEUKÆMIA IN AN X RAY WORKER.

WITH A DISCUSSION OF PREVIOUSLY REPORTED CASES.*

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WE have recently had the opportunity of observing a lay X ray worker who developed myeloid leukæmia after ten years' continuous employment. We were specifically asked whether the patient's work could be regarded as the cause of his leukæmia. We therefore examined the scanty published records with some care and, since no case has previously been reported in this country and very little seems to be known about the possible relationship between radiations and the production of leukæmia, we think it may be of interest to record our case and to attempt a critical discussion of the available evidence. We find that much of the evidence for the causal relationship between radiations and leukæmia rests on such an unsubstantial foundation as to be quite unconvincing.

Case Report.—The patient began X ray work in 1914 at the age of 33. He joined the Army on the outbreak of war and, after a preliminary course of training, began regular work as an X ray assistant in a military hospital in the south of England. In 1916 he was sent to another military hospital to start an X ray department, and remained there two years. In 1918 he was sent to a special orthopædic hospital in the north of England. Here he was in charge of the whole apparatus, and carried out all the routine X ray examinations until March, 1925, when the hospital closed down. He was thus actively engaged in X ray work for about ten years, and the first symptoms began a few months before the end of that time. We have no details of the degree of protection afforded by the apparatus he used. He stated that the ventilation during the last seven years was poor.

He first complained of exhaustion, substernal pain, and breathlessness on exertion towards the end of 1924, and

* Based on a paper read before the Liverpool Medical Institution on Nov. 17th, 1927.

these symptoms, with loss of weight and energy, continued during 1925. In August of that year splenic enlargement was noticed, and in December, 1925, he was sent to see Dr. A. D. Bigland at the Royal Infirmary, Liverpool. A blood count made by one of us at that time showed 256,000 white cells with the typical picture of myeloid leukæmia. The spleen reached the level of the umbilicus. In the early part of 1926 he was treated with benzol with no improvement, but in July, 1926, started X ray treatment at the Royal Infirmary, Liverpool, with marked temporary benefit. The spleen shrank rapidly until it was only just palpable, and the white count in November, 1926, was 14,000. During the early part of 1927, however, the condition relapsed, and further X ray treatment proved ineffectual. He died on Jan. 4th, 1928, the last observations in November, 1927, showing a myeloblastic termination. No autopsy was permitted. (See table.)

34, he had an abrupt hæmatemesis. Marked deterioration in health appeared in May, 1924. Splenomegaly was noticed in June, 1924, when the blood showed 146,000 white cells with the typical picture of myeloid leukæmia. Temporary improvement followed a course of X ray treatment, but later a rapid decline ended in his death in January, 1925.

At autopsy, the spleen weighed 2·45 kilos. The spleen and marrow showed myeloid metaplasia; the testicle was atrophied. The authors were unable to demonstrate radioactive substances in the organs by photographic methods.

The second man in July, 1924, when aged 40 was taken ill with anæmia, weakness, and digestive disturbances, the blood examination indicating aplastic anæmia. He also died in January, 1925, autopsy showing a fibrotic marrow. No mention is made of the testis. This is a unique observation of two patients, exposed to radium and later to thorium

DETAILS OF THE BLOOD EXAMINATIONS.

X ray worker. Splenomedullary leukæmia.

—	Dec., 1925.	July, 1926.	Nov., 1926.	March, 1927.	August, 1927.	Nov., 1927.
Hæmoglobin percentage ..	90	40	92	74	62	50
Red cells ..	5,150,000	2,700,000	5,300,000	3,775,000	3,850,000	3,375,000
White cells ..	256,000	460,000	14,062	36,875	80,625	355,000
Platelets	585,000	—	430,000	269,000	163,000	95,000
Films	Typical. Myelocytes approx. 20 per cent.	—	Myelocytes approx. 5 per cent.	Myelocytes 20 per cent.	Myelocytes 25 per cent. Myeloblasts numerous.	Myeloblasts largely increased.
Spleen	At umbilicus.	3 fingers-breadth below umbilicus.	Just palpable.	3 fingers-breadth below costal margin.	5 fingers-breadth below costal margin.	4 fingers-breadth below umbilicus.

X ray treatment started 13/7/26.

Other Case Reports.

CASES 1–4.—Von Jagie, Schwartz, and Siebenrock, Vienna, 1911,[13] reported four cases of lymphatic leukæmia. The complete report is in the following terms: "Some years ago a radiologist practising in Vienna died from this disease (lymphatic leukæmia), and the story goes that a radiologist of Munich died similarly. One of us (Schwartz) had the opportunity of examining the blood of a chemist who had worked for a long time in a radium factory. We have also information that a radiologist in America recently died from the condition."

It is clear that the second case mentioned cannot be seriously entertained, and Carman and Miller (1924) were unable to trace the American radiologist. This report becomes reduced, therefore, to two possible cases, and even in these no details are given.

CASE 5.—Aubertin,[2] France, 1911 (quoted by Jaulin, 1927,[14] also Emile-Weil, 1925[5]). The latter says: "M. Aubertin has written, without details, that he knew of a case of myeloid leukæmia observed by Prof. Vaquez—namely, the radiologist K. . . ." We have failed after a long search to find Aubertin's original statement, but it will be seen that Emile-Weil specifically states that no details were given.

CASE 6.—Carman and Miller,[6] Mayo Clinic, 1924, reported the case of Dr. Mills, aged 46, who had been in busy practice as a radiologist for 14 years. The authors state that "he was not punctilious as to protection and sometimes omitted to wear an apron." In the latter part of 1923 he complained of extreme exhaustion at the end of the day's work, and in January, 1924, a blood count showed a marked lymphocytosis. He went to the Mayo Clinic in the same month and was found to have enlarged cervical and inguinal glands. The blood showed hæmoglobin 65–70 per cent., red cells 14 millions, white cells 30,000, with 96 per cent. of lymphocytes. Shortly after entering the clinic he was striken with acute appendicitis for which operation became imperative, and he died three days after the operation.

CASE 7.—Emile-Weil and Lacassagne,[5] France, 1925, described two cases of exceptional interest. The two patients were research chemists who had worked with radioactive substances before the war. After military service from 1914–16 they were recalled from the front for work in a radium factory, continuing there until the end of 1920. They then undertook research into therapeutic preparations of thorium X, working, as the authors declare, under similar conditions, in a badly ventilated laboratory, and with no protection against the emanations of the substances they handled. From the end of 1923 onwards the first took over the administrative direction of the works and only did actual laboratory work in the absence of his colleague. Both were robust men, and this first one, in whom we are particularly interested, married in 1919 and became a father in 1920. In December, 1923, when he was

in almost identical circumstances, one of whom died of aplastic anæmia, the other of myeloid leukæmia.

CASE 8.—Béclère,[5] France (quoted by Emile-Weil, 1925, and Jaulin, 1927). This unpublished case rests on a statement by Emile-Weil. "In connexion with our case (thorium worker, supra) we made inquiries of M. Antoine Béclère, who told us he had knowledge of a case of myeloid leukæmia occurring in a radiologist of Poitiers."

CASE 9.—Merklen, Wolf, and Néel,[17] Strassburg, 1925. The patient was a German woman aged 62. In 1917 a single dose of X rays of seven hours' duration, details unknown, was applied to the abdomen by Kronig at Fribourg for uterine fibroids. In 1921 she had a hæmatemesis. Four years later (January, 1925) she consulted the authors for indefinite digestive trouble and weakness. They found an enlarged spleen, the blood showing 400,000 white cells with 51 per cent. myelocytes and 3 per cent. myeloblasts. The patient died in February, 1925, a count shortly before death showing 960,000 white cells with 16 per cent. myeloblasts.

Assuming that the hæmatemesis marked the beginning of the leukæmic state, the onset occurred four years after the X ray exposure.

CASE 10.—MacCallum,[15] U.S.A. In the third edition of his text-book of pathology MacCallum makes the following statement (p. 390). "I saw one case recently in which the irradiation of a mediastinal lymphosarcoma coincided with the appearance of leukæmic changes in the blood, soon followed by death."

These 11 accounts represent every scrap of evidence we can find which appears in any way to associate radiations with the production of leukæmia. It is clear that we must at once discard Von Jagie's Cases 2 and 4, and the objection may be made to MacCallum's that it may from the first have been leukæmia with a temporary aleukæmic stage, or an example of leucosarcomatosis. In Von Jagie's Case 1 there is no mention of personal knowledge. This leaves seven cases for critical discussion. Of these in No. 3 (Schwartz), No. 5 (Aubertin), and No. 8 (Béclère) no details are given, but as the language used suggests personal knowledge we accept them for discussion, though with reserve. Even in the other four cases, where sufficient detail is at hand to establish the diagnosis, there are no precise observations on the amount of exposure.

Taking, then, the seven cases, the only general facts which are clearly apparent are:—

Four occurred in radiologists, one followed therapeutic use of X rays, and two were in radium and

thorium workers respectively. In only two cases (Carman, Emile-Weil and Lacassagne) is there specific mention of inadequate protection or bad conditions. Five were of myeloid, two of lymphoid type. It follows that any explanation as to the relationship of radiations to leukæmia must be adequate to cover either type. In five cases a statement of time is made, as under:—

Case.			
3	Von Jagie and Schwartz.	Radium worker	"A long time."
5	Carman and Miller.	Radiologist	14 years.
7	Emile-Weil and Lacassagne.	Radium 4 yrs. Thorium 4 yrs.	Approx. 8 years.
9	Merklen et al	Therapeutic use, single X ray exposure.	Inception at least 4 yrs. later.
11	Evans and Roberts.	Radiologist	10 years.

Assuming for the moment a causal relationship between radiations and leukæmia, it appears (*a*) that X rays are more incriminated than radium; (*b*) that considerable length of time is necessary for the condition to develop; (*c*) that the amount of dosage required is small; (*d*) that both lymphoid and myeloid types may occur.

Effects of Radiations on the Circulating Blood and Blood-forming Tissues.

1. *Destructive Effects.*—It is clearly established that radiations can destroy the cells both of the circulating blood and of the parent blood-forming tissues. Adopting the dualist theory of the origin of the blood cells—that the marrow produces red cells and granular white cells, and the lymphoid organs the lymphocytes—we may briefly examine the evidence under three heads—viz., the effects on (*a*) the circulating blood cells, (*b*) the lymphoid tissue, (*c*) the bone-marrow. There seem to be distinct differences, not always clearly recognised, between the effects in man and in experimental animals. In both, however, it is evident that the white cells and their parent tissues suffer before the red cells.

(*a*) *Circulating Blood.*—In animals the invariable result is a destruction of the lymphocytes,[4 19] which was shown by Aubertin and Beaujard, from the number of degenerated cells seen in blood films, to occur in the blood stream. In man, under ordinary professional exposure, the first result is leucopenia with relative lymphocytosis—i.e., it is the granular cells which are first killed off.[3 13 21] Yet this is not absolutely constant. Von Jagie mentions cases in professional workers with absolute as well as relative lymphocytosis; Aubertin cases with neutrophilia and moderate eosinophilia; Pfahler cases with moderate eosinophilia. Minot and Spurling[18] in cancer patients found leucopenia with lymphopenia and relative granulocyte preponderance, and sometimes marked eosinophilia (up to 23 per cent.).

(*b*) *Lymphoid Tissue.*—In animals there is no doubt that not only the circulating lymphocytes but also the lymphatic glands and lymphoid elements of the spleen suffer long before the bone-marrow,[4 11 19 24] and they may be almost totally destroyed before signs of marrow injury appear—indeed, some observers say that the myeloid elements may appear to be stimulated. In man very little seems to be known about injury to the lymphatic tissues; it is not even mentioned in those cases of aplastic anæmia where the bone-marrow has been completely overwhelmed.

(*c*) *Bone-marrow.*—In man the maximal effect of the destructive action of radiations is seen in the condition of aplastic anæmia, a condition in which the red cells and granular white cells suffer pari passu. Of this proved occupational hazard of workers in radio-active substances, Jaulin[14] has collected nine examples, six in radium workers and three in radiologists. Hoffmann[12] mentions three cases occurring in association with necrosis of the jaw in girls engaged in painting luminous watch dials with a paint containing radium and mesothorium. Martland, Conlon, and Knef[16] refer to two more of these girls, and also mention their personal knowledge of two unpublished fatal cases in radiologists. The condition may readily be reproduced in experimental animals with any form of radio-active substance; it is simply a question of sufficient dosage.

These observations have been extracted from a bulky and confused literature with the purpose of showing that while there is positive evidence that radiations exert destructive effects on the blood and blood-forming tissues, yet there are great variations in the susceptibility of the different parts of these tissues, and even among different individuals. This is not surprising in view of the differing conditions under which the observations have been made. As Warren well remarks, "It must be emphasised that great confusion exists in the study of the effects of roentgen radiations on the body tissues because of the lack of suitable standardised measuring devices, the absence of an easily established biological unit of dosage, and the failure of the various investigators to consider the variables introduced by the different wave lengths of radiations with their variation in penetration and absorption." To which we may add that too little attention has been paid to the differences between the effects in man and in experimental animals.

2. *Stimulating Action.*—The case for a stimulating action of radiations on the blood-forming tissues is not by any means so clearly made out. In his Mackenzie-Davidson lecture, 1927, Rolleston[22] balances the evidence for and against a stimulating action, and agrees with Desjardins[7] that evidence in favour is lacking, and that any apparent stimulation is invariably followed by more or less functional or organic deterioration. Martland[16] came to the same conclusion. In a later review Warren[23] sums up the question by saying: "Almost infinitesimal amounts of the very longest wave lengths may be able to stimulate normal cells (lymphocytes) with the production of normal daughter cells. The proof for a general stimulating effect of roentgen radiation is lacking." This statement is based on the work of Murphy, who, using a minute dose of soft rays from a special Coolidge tube, found definite evidence in mice of stimulation of the lymphocytes: an increase in the circulating blood, and notably increased mitoses in the lymph glands and spleen. With slightly larger doses he observed lymphopenia, with increase of polymorphs and apparent stimulation of the bone-marrow. This is the only clear evidence in favour of a stimulating action. It is interesting, however, in view of the smallness of the dose, as presumably under modern conditions the exposure in X ray workers is very small.

3. *Experimental Production of Leukæmia.* — As already pointed out, aplastic anæmia can readily be reproduced in experimental animals. There is no mention in the literature of the reproduction in animals of any disease comparable with leukæmia, not even in Murphy's careful and extensive work. It may be objected that it is uncertain whether leukæmia as it occurs in man is met with in lower animals, though in a recent review of this subject Opie[20] concludes that "leukæmias conforming with the types met with in man occur in many, if not all, domestic animals, and in small animals available for experimental studies." The relation between leukæmia and radiation would, however, be much more definitely established if the condition could be experimentally produced.

Mechanism by which Radiations might bring about Leukæmia.

Von Jagie, in trying to account for cases of lymphatic leukæmia, suggests that the lymphoid hyperplasia is compensatory to the destruction of the granulocytes, "in the Weigert sense"—i.e., of regeneration after loss. Ziegler, one of the early workers, by the application of large doses of X rays to the spleen, was able to produce in animals destruction of the lymphoid follicles with myeloid metaplasia of that organ. At the same time he noted a myelocytic blood reaction, and thought that the damaging

action of the X rays on the lymphoid tissue of the spleen disturbed a hypothetical mutual inhibitory reaction existing between the lymphoid and myeloid systems. There seems, however, little proof that this can be regarded as comparable to human leukæmia; it is, rather, a myeloid reaction, comparable to Murphy's lymphoid reaction.

Farley[10] says:—

"In view of the undoubted production of aplastic pernicious anæmia by the action of X rays on the bone-marrow, it is not surprising that the production of a myelogenous type of leukæmia should be reported, but the production of lymphatic leukæmia by such means should not be credited without very close scrutiny."

Amundsen,[1] referring to the cases of lymphatic leukæmia, says that the lymphocytes in professional workers quickly regenerate, and that no doubt the cases of lymphatic leukæmia occurring in radiologists "may be regarded as a lymphocytic regeneration overshooting the mark."

Emile-Weil and Lacassagne assert positively that their two thorium workers represent the difference between a destructive effect by a large dose and stimulation by a small dose. Yet, since Emile-Weil admits in a later paper that as far as could be reckoned the degree of exposure was equal in the two patients, their cases form a singularly unfortunate basis for such an argument, and could be better explained on the ground of individual differences between the two men. Carman[6a] also is of opinion that destructive and stimulating effects may occur, varying with the amount of the dosage.

All these explanations postulate a persistent stimulation, whether primary or regeneratory. We have already shown that the general evidence in favour of a stimulating effect is lacking at the present moment. Until further more conclusive evidence is at hand we must regard any such explanation as attractive but unproved. At the same time it does not seem possible in the present state of knowledge to advance any other satisfactory working hypothesis.

The other possibility, which seems to have been completely ignored, is that in these cases the leukæmia was a pure coincidence. When we consider the small number of cases reported and the large number of persons either working with, or treated by, radio-active substances, we feel strongly that this is a perfectly reasonable explanation. The clinical characters of either type of leukæmia are so definite that it is difficult to imagine that any large number of cases would long escape recognition.

Conclusions.

After careful examination of the literature we conclude that the case against radiations as a cause of leukæmia is not proven on the following grounds:—

1. The slenderness of the available evidence, both in regard to the small number of cases and the lack of detail in a large proportion of the reports.
2. The lack of experimental proof.
3. The difficulty, in the present state of knowledge, of advancing any satisfactory theory of the way in which radiations may bring about leukæmia.
4. The impossibility of excluding coincidence.

We use the expression "not proven," because we do not feel that the possibility of causal association can be positively denied. It is obviously a matter of some importance both from the point of view of the professional worker and the patient under treatment. We would suggest that the heads of radiological departments should occasionally review their staffs and patients. Clinical examination and a blood smear would give the diagnosis in the great majority of cases if they occurred. We think that an open mind should be kept on the subject, and in the meantime it is clearly of importance that all cases should be reported.

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(Continued at foot of text column.)

Clinical and Laboratory Notes.

AN UNUSUAL ATTITUDE OF THE CHILD IN UTERO.

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THE attitude and presentation in this case appear to be so uncommon that it is worth recording.

The patient was 32 years old and a multipara, with three living children out of five normal labours and one miscarriage. The date of the last menstruation was Feb. 23rd, and labour was due on Nov. 30th, 1927. The patient first came to the antenatal clinic of the Liverpool Maternity Hospital in about the thirtieth week of pregnancy. For some time she had been under treatment for bronchitis. There was severe cough, profuse mucopurulent expectoration, and some dyspnœa, which did not respond well to the usual treatment. Throughout the antenatal period the child changed its position frequently. At the beginning of the thirty-ninth week the position was transverse with the head in the right iliac fossa. The fœtal heart sounds were heard loudly in the midline about 3 inches above the symphysis. External version was tried but it was found impossible to move the head out of the right iliac fossa. On attempting to push the breech up towards the fundus it rotated forwards and could be brought almost over to the right side, but returned to its original position at once.

The case was X rayed by Dr. R. E. Roberts, who sent me two very interesting and beautiful films, which showed the child lying with the head hyperextended in the right iliac fossa and the thorax over the brim of the pelvis with the arms behind the back. The back was extended, and the thighs were extended with the legs flexed at the knees so that the feet were approaching the head. External version was again attempted but without success, the reason being clear from a consideration of the attitude of the child. Pressure on the head in any direction only increased the extension, while the breech could not be manipulated on account of the extended limbs. Combined external and internal manipulation could not be carried out without an anæsthetic, which was contraindicated by the chest condition. Cæsarean section under spinal anæsthesia seemed to hold out the greatest hope for both mother and baby.

Cæsarean section was performed on Dec. 3rd, 1927, the 283rd day of gestation; 1 c.cm. of stovaine was injected into the spinal canal in the second lumbar space, and the patient was quite ready for operation in about ten minutes. Before the operation, and while the abdomen was quite anæsthetic, version was again tried but without success. The operation presented no difficulty and was quickly carried out. A noticeable feature was the almost complete absence of bleeding from the uterine incision. This absence of bleeding

Drs. Howel Evans and R. E. Roberts: References.

(Continued from previous column.)

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was also marked in six other cases in which spinal anæsthesia was employed; in a seventh case ½ c.cm. of *pituitrin* was given on account of fainting due to falling blood pressure, and in this case the bleeding was very free.

On opening the uterus the child was found in the position and attitude shown in the radiograms. Delivery was easy and the placenta was found on the posterior wall, rather lower than usual. Whether this low position of the placenta had been a factor in causing the presentation it is hard to say. It was not abnormal in size or bulk. There were two small white infarcts towards the centre. The child weighed 8 lb. 4 oz. and was fully developed and normal in every respect.

Except for an exacerbation of the chest symptoms for the first 24 hours, the patient made a splendid recovery. Anæsthesia was induced at about 10.30 A.M.; sensation was returning at 11.45 A.M., and had returned fully at noon.

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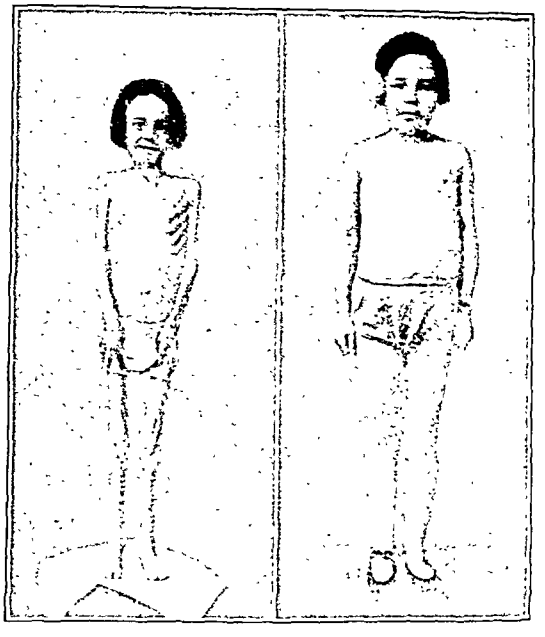

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On admission he complained of aching pain in the abdomen, and declined food. There was no vomiting, the stools were

clay-coloured, and the urine of a high colour, with bile in abundance. The skin and conjunctivæ showed intense jaundice; the mucous membranes were pale and yellow. On examination the abdomen was generally tender, especially over the liver, which was enlarged almost to the umbilicus. The temperature was 100·4° F., pulse-rate 116, respirations 26. The provisional diagnosis was "obstructive jaundice; acute septic cholangitis." The radiologist reported: "Liver shadow much increased downwards and slightly upwards, the right diaphragm being raised about 1 inch. No pleural effusion. No evidence of gall-stone or abscess (but neither is likely to show)." Stools were examined by cultivation, but no organisms of the enteric or dysentery groups were found. The blood reaction was negative to typhoid and paratyphoid A and B. The Wassermann reaction was negative. The van den Bergh reaction was biphasic.

The progress of the case was steadily downward. The temperature was intermittent, rising as high as 104°, and the pulse-rate ran up to 130 and ultimately to 150. The jaundice became more intense, vomiting developed and became persistent, and the boy died after an illness of almost six weeks.

Post-mortem examination showed numerous small abscesses scattered over the whole of the liver, with one large abscess in the upper part of the right lobe. This had an inner lining which peeled off completely and easily. The spleen had no abscesses. The kidneys were enlarged and fatty, without abscesses. From the abscesses streptococci were grown, and microscopical examination of the wall of the large cavity in the liver showed that it was the laminated ectocyst of a hydatid cyst.

The patient's medical adviser, Dr. J. H. Rowan, ascertained that about three years ago the boy had been in contact with a dog which had had to be destroyed for some unknown disease. It had wasted and had yellow eyes. The boy had never lived abroad. Apparently the course of events was that the boy developed a hydatid cyst in which suppuration took place, leading to generalised streptococcal hepatitis.

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AT the annual general meeting of this Society, held on Oct. 8th, Dr. J. WALTER CARR said:—

When in the summer of 1923 I had the privilege of delivering the Annual Oration before the Medical Society of London, I chose for my subject the way in which the medical profession, if only it had a free hand, could prolong the lives and improve the health of the population of this country. I pointed out that by the removal at an early stage of the intestinal cesspool or large bowel, of the tonsils, and later on of the permanent teeth shortly after their eruption, an enormous amount of ill-health and of actual organic disease would necessarily be abolished. In addition, that removal of the breasts and of the uterus, as soon as their functional activity had come to an end, would completely eliminate a large proportion of the deaths from cancer in females. Also, that by a highly organised system of prophylactic vaccination we might hope almost to abolish the great group of infective diseases—viz., the acute specific fevers and the acute infections of the respiratory organs—which are responsible for such a large percentage of the deaths in this country; that by the provision of suitable housing accommodation and of other hygienic improvements for our children and our cows we might anticipate the practical extinction of all forms of tuberculous disease; that by psychotherapy we might expect to prevent, or at least cure in an early stage, the majority of mental disorders; that by the habitual use when necessary of prophylactic measures, venereal diseases might be kept in check; and that, finally, premature degenerative changes would very largely be prevented by appropriate endocrine medication. In fact, men would die only of old age or from road accidents. If it is possible for the medical profession to confer such inestimable benefits upon the civilised world (the uncivilised races, we gather, already enjoy perfect health and only need to be protected from death by violence), it becomes our urgent duty to consider what steps we ought to take to secure for our fellow-creatures blessings so far-reaching.

The Motives of Mankind.

To get the whole subject in the right perspective we have to consider what are the motives which normally dominate able and ambitious men; for, after all, doctors are first and foremost human beings, men of like passions with other men, although as a result of their training and daily work, their ultimate aims doubtless tend to be somewhat more altruistic and less directly selfish than those of the majority of their fellows. I emphasise also that it is the leading and clever men whose ambitions we have to consider, because in every department of life it is these who influence policy and determine progress. I take it, therefore, that there are three chief motives which inspire men who aim at becoming leaders and rulers in the world.

1. *Love of Power and Influence.*—The truly ambitious man is, very rightly, not satisfied merely with making a fortune; by itself this brings little real and permanent satisfaction and often only ends in the man becoming increasingly fearful of losing what he has gained, like the patient described by Dr. Arthur Ross in his book on "The Common Neuroses," who explained that there was only £200,000 between him and the workhouse. We all give lip service nowadays to the blessed word "equality," but an able man can never really believe in it. Conscious of abilities above the average, he naturally and rightly wishes to exercise his gifts to the uttermost, and he can only do so by becoming a leader and ruler of men.

2. *A Desire for Uniformity.*—The wish to make other people think, speak, and act as nearly as possible as we do ourselves. The keynote of nature is diversity—no two living things are ever exactly alike—but man's ideal is uniformity. Again, as in the case of "equality," we pay lip service to "freedom," but it is much more freedom for ourselves than for others. The more capable, the more earnest, the more convinced a man is that he is right himself, the more determined is he likely to be—especially as he gets older—that it is his duty to make other people think and act as he does, so that if he gets the power to compel others to imitate him, the more certain will he be to exercise it to the full. If that be true of one man, it is still more true of any body of men acting collectively: that is, of a bureaucracy. In either case the desire to exercise power grows with the opportunity of doing so.

3. Lastly, a man, and possibly—though to a much less extent—a bureaucracy, acts under the influence of what is called *conscience*; that is, he wants to be able to convince himself and also other people, that he is not governed by purely selfish motives, but is genuinely desirous of benefiting others. In this way the greatest acts of tyranny and oppression can be, and have been, justified.

The most typical and successful example of the exercise of these three dominant motives in human life is afforded by the history of the Church in the Middle Ages. First of all, by the use of purely spiritual authority and influence, it gradually obtained supreme power over practically every department of human life. Having gained this power, it ruthlessly extirpated every form of what it chose to consider as heresy or schism, and, lastly, it did all this, justified every cruelty and every kind of oppression and tyranny, under the specious plea that it was acting in the true interest of the victims.

was also marked in six other cases in which spinal anæsthesia was employed; in a seventh case ½ c.cm. of pituitrin was given on account of fainting due to falling blood pressure, and in this case the bleeding was very free.

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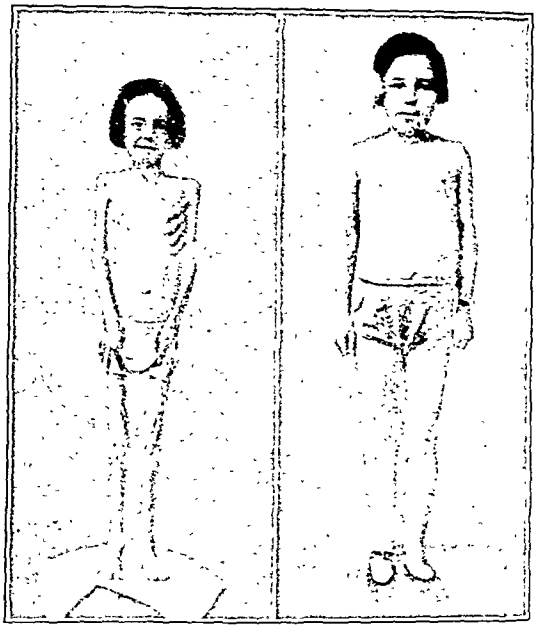

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Now comes the opportunity for the medical profession to grasp the power which has fallen from the hands of the Church. The idea of eternal punishment, whether for better or worse, no longer exercises much influence over men's lives or minds, and the satirical words of the Eastern philosopher, written thousands of years ago, "Skin for skin, yea, all that a man hath will he give for his life," are probably at least as true to-day as when they were first penned. Assure any man or woman with sufficient emphasis that if he does not follow your advice he will certainly perish miserably of some dire disease, particularly cancer, and in all probability he will follow your instructions, even to the point of unhesitatingly sacrificing any part of his anatomy, as readily as his ancestor centuries ago would have done, if told that unless he propitiated the Church by some suitable and adequate contribution his body would certainly burn everlastingly in hell fire. I am inclined to think that the leaders of surgery, being actuated by exactly the same motives and ambitions as are any other body of men, are to an increasing extent availing themselves of their present-day opportunities.

Medical Control of the Public.

Let us consider how the medical profession is striving to reach, and may hope to attain, the three ideals I have described.

The foundation upon which we may hope to build up power and authority over our fellows must be the Ministry of Health. It might at first seem desirable that the highest official of all, the Minister himself, should be a medical man or a medical woman, but a little reflection will show that this is not really desirable. Here we may learn again from the history of the Church in the Middle Ages. How often do we read of an emperor or king ostensibly supreme, but of the real power behind the throne being exercised by a cardinal or some other ecclesiastic, so that the nominal ruler was left to face the unpopularity of unduly tyrannous or unwise acts for which his advisers were really responsible.

Under the Ministry of Health there would be eventually a complete State Medical Service, such as a large number of doctors already demand. The chief medical officer to the Ministry would occupy the position and have much of the authority of the Pope in the mediæval Church; under him would be a number of inspectors and consultants—or regional medical officers, as they are termed at present—who would correspond in position with cardinals and bishops, whilst to every unit of the population, say to every thousand people or so, would be allotted a doctor who would correspond with the parish priest in the Church, and who might be called, provisionally, the district medical officer. He might have a larger number of people under his care and be given two or three assistants who would be in training for the higher and more responsible post. A separate staff of doctors would be entrusted with the care of the State or municipal hospitals, whilst another branch of the profession would act as medical officers of health, concerned exclusively with preventive medicine, either general or special—such as inspectors of factories and workshops.

To the regional medical officers and their assistants would gradually be confided complete control over the population in their respective areas. It is difficult, indeed, to conceive of any part of a man's daily life, work or play, from his conception in utero until the final disposal of his remains after death, in which health is not concerned in some way or another; and consequently it follows that in every step and department of life the authority of the medical man must ultimately become supreme. The mother would be kept under careful observation throughout pregnancy, the confinement would take place in a maternity hospital, the child would be looked after first at an infants' and later on at a children's clinic; throughout school-life he would be examined repeatedly by the school doctor, who would see that any medical or surgical treatment required was carried out either by the doctor of the family or at a suitable institution. On leaving school his choice of a vocation would be determined largely by the school and family doctors, in consultation with a psychologist, so that there should be no misfits in regard to employment. Necessarily also the doctor would have the final decision in such matters as to where the man should live, his hours of daily and weekly work, the length of holidays, and the date of retirement from employment. Legal compulsion would be essential to support his authority, especially in regard to such matters as vaccination—of course, not merely against smallpox, but for a number of other diseases, especially against diphtheria—and also to ensure that operations essential for the child's well-being were not evaded owing to the ignorance or prejudice of parents. It is interesting to note in regard to this important matter that a commencement is already being made by the taking of proceedings in the police-courts against refractory parents who perversely refuse to have their children's tonsils and adenoids removed. No doubt in a little time patients who neglect to continue treatment for venereal disease until they are nominally cured will be dealt with drastically. Doubtless, also, some method of preventing every acute infectious disease will in time be discovered and its use imposed upon a well-educated population. Most important of all, however, will be the decision which the doctor alone can make as to a man's fitness for marriage and, if fit, as to the suitability of his choice of a partner in life. No marriage would be permitted without previous medical sanction, and a newly married couple might be informed that the State expected them to produce a given number of children at recognised intervals. It would be easy in a Socialist commonwealth to provide suitable punishments for any transgression of these professional directions.

With the district medical officers exercising such powers as I have outlined, it would be necessary in important or difficult matters, such as the question of any major operation, or the necessity of final retirement from work, to allow an appeal to a higher authority, an inspector or consultant, whose decision would be final.

Another matter upon which the medical profession would naturally have the deciding voice is in the use of alcohol, including the desirability of following the example of our American cousins and imposing total prohibition upon the country.

Orthodoxy an Essential.

Coming to our second great aim, that of firmly establishing professional uniformity and orthodoxy, we have two separate problems to consider; first, that of preventing every form or description of medical practice outside our own ranks, and secondly, that of extirpating at its earliest commencement any heresy or schism amongst ourselves.

With regard to unqualified practice the situation at present is far from ideal; the British public still insists upon its right of private judgment, that is, upon its freedom to consult any one who offers to cure or relieve disease, so that quacks of every description are able unrestrainedly to prey upon all classes of the population from the wealthiest to the poorest—especially upon the former—provided always they do not pretend to possess any medical qualification. If the State were well-regulated from the medical standpoint, such wrong-doing would of course not be tolerated for a moment and, naturally, our ambition must be to have all forms of irregular practice made absolutely illegal. We cannot, it is to be feared, expect to be able to enforce the drastic penalties which the Church in the Middle Ages employed against those outside the regular priesthood who endeavoured to usurp any of its spiritual prerogatives, but at least we must aim at the power to inflict punishments which would effectively prevent unqualified quacks from making a living by the practice of any branch of medicine; with qualified quacks it is more difficult to deal. In the meantime we are making some progress by the enforcement in

the out-lying branches of our profession of regulations even more effective than those which we are able as yet to employ among ourselves. I refer to the complete system of examination and registration now legally enforced upon dentists and nurses, and the increasingly effective means of preventing them from practising unless they are registered.

It is obvious that those nurses fortunate enough to get on the Register must be protected fully from the competition of unqualified people, now that they have to attain such a high standard of professional knowledge as is indicated by the ability to answer successfully such questions as: "What are the symptoms of gastric ulcer? From what other abdominal conditions has it to be diagnosed? Give the points of distinction." "Describe the symptoms and signs of tuberculous peritonitis; what are the complications? What preventive measures can be taken against this disease?" "Write a short essay upon the causation, prevention, and treatment of post-operative pneumonia." "What is meant by the term 'Pott's fracture'? How is this fracture caused? How is it treated? What deformity and disability may ensue if it is unskilfully treated?" "What are the various kinds of ulceration of the cervix? Indicate their chief characteristics. What methods of treatment might be employed in each case?"

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We come next to the more difficult subject of the maintenance of discipline within our own ranks. Until all medical men are brought completely under the ægis of the State, it would be essential that they should be subject to a strict trade-union control, to prevent such delinquencies as the acceptance of inadequate rates of payment, fee-cutting, or any form of blacklegging. To this union would be consigned the responsibility for medical defence and medical charities, and it would be clearly understood that all practitioners who transgressed its rules would be liable to lose the privilege of medical defence for themselves and all claim to medical charities, either for themselves or their dependents. Incidentally, we note that once all doctors had become State officials they would probably become immune from actions for damages, under the far-reaching constitutional principle that "The King can do no wrong." There remains the question, how to prevent or punish deviation from the paths of professional orthodoxy. For this purpose the powers of the General Medical Council would have to be strengthened, so that any serious heterodox practices might be included under the famous term "infamous conduct in a professional respect," and accordingly dealt with promptly and suitably.

Research will necessarily form an important part of the medicine of the future, but it must be under strict control and on carefully regulated lines. Herein lies the obvious danger that medicine may become static and be governed increasingly by tradition and authority as in the Middle Ages. Research would finally be controlled by the elder statesmen of the profession and age, particularly when combined with power, is always conservative. Minor discoveries and novelties, especially in the matter of new remedies, concerning which people of all ages and conditions are credulous, would no doubt be tolerated or even encouraged, but really far-reaching and important new facts must be subversive of something or other, and hence would be condemned as revolutionary. We must accept the oft-demonstrated fact that as we get older we become less and less receptive of new ideas and, finally, hopelessly enmeshed in the traditions of the past. This is the case usually with individuals, but with groups of individuals it is even more so. The rules, the traditions, the conventions, the customs of a ring of senior bureaucrats must necessarily be almost inviolable, and the junior who comes with some startling new discovery will be fortunate indeed if he can secure hearing and recognition.

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The Idealists.

To attain our third object in life and so complete the sum of our ambitions, it remains for us to convince first of all ourselves and then the public that all our motives are purely unselfish and that our time, thoughts, and endeavours are devoted solely to furthering the physical wellbeing of our fellows. We need have little difficulty in satisfying ourselves on this point, for probably we already cherish the idea that we are members of the one profession (apart possibly from the clerical) which wholeheartedly sacrifices itself to the interests of other people. It is essential, however, for us to persuade the general public that by giving us autocratic control of their lives and by strictly obeying our orders, their happiness will be increased, their health improved, and their days prolonged. Doubtless what they will be most unwilling to forego will be the privilege of drugging themselves, but necessarily they must do so, for clearly practice by unqualified people is the same whether exercised on other men or on themselves. What can be more dangerous to health than for the laity to treat themselves? In fact, only a few years ago we witnessed a determined attempt by the medical officials of our paternal State to prevent doctors prescribing dangerous drugs for themselves; an attempt only abandoned apparently when it was realised that it would be exceedingly difficult to prevent a doctor from writing a prescription for professedly some member of his family and then taking the medicine himself. All patent medicines must necessarily be suppressed, despite the protests of an impecunious Chancellor of the Exchequer, and all drugs, except a few of the simplest possible character, as, for instance, so harmless, but indispensable an adjunct of modern civilised life as paraffin, sold only on a doctor's prescription by a properly qualified chemist, just as opium, cocaine, and a few similar drugs are sold to-day.

In our expansive moments, especially in after-dinner speeches, we are already fond of pointing out to our audiences, particularly if non-professional, that we afford an unique example of a profession ever actively engaged in trying to destroy the sources of its own livelihood; and that by doing our best to prevent disease we are always diminishing the number of our potential patients. In fact, in one form or another we repeat the statement so often that there is actually some danger we may begin to believe it, although even this would have its advantages, for the more completely we are convinced that we are unselfishly sacrificing ourselves in the interests of the public, the more likely are we to be able to persuade them to entrust us with ever-increasing powers over their lives and habits.

As a matter of fact we need not be in the least alarmed about our own material prospects, no matter how successful may be our efforts at prophylaxis, for it will always take at least as many medical men to prevent disease as to treat it (advisedly I do not say cure it) after it has developed. As well might the drivers of stage coaches have complained of unemployment when railways were first built, regardless of the fact that the latter would employ many times the maximum number of men who ever drove coaches. It may be that by slow degrees many more men will be employed in preventive—and somewhat fewer in curative medicine (falsely so-called), but the change will be so gradual that no serious inconvenience is likely to arise to individual members of the medical profession.

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Medical Despotism.

Such are our ambitions—to attain under the conditions of our present-day civilisation the position, the power, the influence, the prestige which the Church possessed in the Middle Ages; to bring about absolute uniformity and conformity in our own ranks, to extirplate completely every form of irregular and unqualified practice, and to use our powers for the preservation of the health of the community, for the prolongation of their lives, and for the best interests of their bodies, just as the Church used it for the welfare of their souls. It sounds, indeed, a glorious ideal; I can only hope most earnestly we shall never attain it, both for the sake of the public and also, eventually, in our own best interests.

Even if it were possible of fulfilment, the greatest objection of all to it is that human nature is so constituted that the possession of autocratic power in any department of life inevitably converts a man into a tyrant. It would seem that no one man, nor any body of men, is capable for any considerable time of exercising uncontrolled power without being morally ruined as a result. Only by an effective opposition, only by the constant interaction of contending forces, only by the knowledge that if he makes a mistake, retribution will sooner or later overtake him, can a man be preserved from what I ought perhaps to call a superiority complex, from arrogance, conceit, and disregard for the rights and feelings of others. The fact that our motives and purposes in seeking to impose our wills upon other people are of the highest and best only makes matters worse, because if we are firmly and conscientiously convinced that we are unselfishly out to benefit others, then increasingly we feel that the end justifies the means and that we are morally bound to use every possible effort and ruthlessly to overcome all opposition in order to attain that which we feel certain is right. Clifford Allbutt truly said: "Conscientiousness without enlightenment has to account for some of the darkest chapters of human history." A medical despotism, by leading eventually to an inevitable reaction would, like all other despotisms, inevitably bring about its own downfall. Just as the moral despotism of the Puritans during the time of the Commonwealth was followed by the licentiousness of Charles II.'s reign, so the tyranny of hygiene would inevitably be followed by a period of laxity in regard to all the laws of health, especially probably in regard to those moral laws, obedience to which is at least an essential to the real health of a community as is obedience to physical laws.

It is difficult, if not impossible, to draw any hard-and-fast line between enthusiasm and crankiness—the two are often combined. An enthusiast who was also a crank might easily get to the head of affairs and consider it his sacred duty to bring into operation new ideas or fads which might be entirely erroneous. Take, for example, the modern fashion for prophylactic vaccination against influenza. I venture to say that at present our knowledge and experience are far too indefinite to justify us in strongly advising—let alone in insisting upon—this as a precautionary measure; yet I feel sure there are medical officers of health and of schools who, if they had the power, would not hesitate to insist upon the compulsory inoculation of school-children (and preferably of all members of the community) at least once a year.

In this connexion I may refer to the results of a most interesting test made a few years ago at a public school. It was decided by the governing body to inoculate against influenza, before the Christmas holidays, all the boys whose parents were willing. There were about 350 boys in the school, and of these 60 per cent. were inoculated. The inoculation was carried out by a well-known bacteriologist who was most anxious that the experiment should be a success. When the school reassembled after the Christmas holidays cases of influenza soon began to appear, and eventually 113 boys (32 per cent. of the total number in the school) were attacked. It was a remarkable fact that the percentage of boys inoculated and the percentage of those attacked who had been inoculated was exactly the same in each case—viz., 60 per cent. Moreover, the school medical officer reported that there was no difference in the symptoms or type of the disease amongst those who had and those who had not been inoculated; all the cases were mild except that one of the inoculated boys developed slight broncho-pneumonia, but recovered completely.

The Permanence of Regulations: Small-pox and Vaccination.

Another difficulty to be faced under the rule of a medical bureaucracy would be that if once any official procedure were established by law it would be a long and difficult process to get any alteration made to suit different circumstances.

Take, for instance, the case of vaccination against small-pox. Are we adapting ourselves to the marked changes in type of that disease which have developed during the last few years? At present the one endeavour of our medical hierarchy is to get the maximal number of people vaccinated and protected as completely as possible. Let it be granted at once that vaccination does (for a certain number of years) protect against small-pox, the question which arises is whether the present form of small-pox is worth being protected against. Supposing some vaccine were discovered which, for a certain number of years, entirely prevented chicken-pox or mumps, would anyone seriously suggest its universal use? I doubt it, yet both these diseases are responsible for no inconsiderable inconvenience and loss of time during school-life, and for the last ten years chicken-pox has been credited with from 40 to 83 deaths, and mumps with from 14 to 41 deaths annually in England and Wales. Is the present form of small-pox really more serious than chicken-pox? I have no personal acquaintance with it, but so far as I can gather, it very rarely gives rise to pitting and hardly makes those suffering from it feel ill—not so ill as vaccination often does. It is not easy to ascertain for how many deaths it is really responsible as distinguished from those in which it is the nominal, but not the actual, cause of death. In 1926, according to the report of the Registrar-General, 10,146 cases of small-pox were notified in England and Wales and 18 deaths were attributed to it, but the report states:—

"The figure quoted is probably overstated, that accepted by the Ministry of Health being 11. The number 18 is arrived at by the application of the rule of tabulation long followed in this country. Under it all deaths on the certificates of which mention is made of small-pox are assumed to have been caused by it unless violence or certain other causes catalogued on page xxii of the 'Manual' of the International List are simultaneously recorded. During 1926 only one death, of a male, aged 58, suffering from cancer of the stomach, was excluded from the small-pox heading under this rule."

We may take it, therefore, that at the very most only 11 deaths were attributable to small-pox in 1926, a mortality of just over 0·1 per cent., or 1 in 1000 cases. In 1927, 14,764 cases of small-pox were notified, and 47 deaths (0·32 per cent.); but no official particulars are as yet available concerning these deaths. Further information as to the entirely misleading character of the present system of registration of deaths from small-pox is afforded by the following facts gathered from the pages of THE LANCET in regard to the first six months of the present year.

During that period 21 deaths were registered from small-pox in the great towns of England and Wales, including London. Concerning 14 of these cases the following interesting and instructive statements are made:—

Three who died in hospital near Bradford are said to have been debilitated subjects, aged 71, 73, and 75 respectively; the certificate of the cause of death in one of them was "myocarditis, senility, small-pox." In a fourth case the certificate was "subacute nephritis, chronic bronchitis, discrete small-pox." In another instance, a woman was in hospital from Dec. 2nd to 17th, 1927, with very mild small-pox; she died on Feb. 2nd from "pericarditis, debility following small-pox, tuberculosis of lungs." In a sixth

instance the certificate was—"ulcerative endocarditis, small-pox."

One fatal case was that of a premature infant; another, a woman, aged 66, "in frail health," cause of death "senility or debility, small-pox"; another was a woman, aged 73, admitted to hospital on Feb. 13th for a mild attack of small-pox; she felt quite well, and remained so till Feb. 29th, when she developed slight bronchitis; on March 3rd she had almost completely recovered, and was to have been discharged on the 8th or 9th, but on March 4th she collapsed and died suddenly. It was stated she had been subject for several years to periodical heart attacks.

Another patient, aged 51, suffered from mild small-pox, but the primary cause of death was pernicious anæmia. A man, aged 77, was stated to have been in a septic condition and very feeble before he contracted small-pox. In another patient the primary cause of death was neoplasm of the lung, and in yet another the patient, when admitted to hospital for small-pox, was suffering from hemiplegia and diabetes, with diabetic gangrene of the toes; the small-pox was said to be a factor of small contributory importance to his death. A child who had mild small-pox with no systemic disturbance developed acute primary pneumonia from which she died; it was stated that the small-pox could have had no appreciable bearing upon the causation of death.

Such are the people who form the majority of those who nowadays are said to die from small-pox! Is it not obvious that the present system of registration is grossly inaccurate and that the real mortality from the disease must be almost negligible?

Circumstances versus *Creeds.*

An exceedingly mild form of small-pox has now been epidemic in this country for several years; ought we not seriously to consider whether a disease which causes such slight constitutional disturbance, such an almost inappreciable number of deaths, and so few—if any—after-results, really calls for the elaborate and most expensive system of hospital isolation which we maintain for it, especially as we are told that in some districts it is considered preferable to have a pleasant three weeks in hospital with small-pox than to suffer from vaccination at home. Also, if the disease is really not more serious than chicken-pox, let us treat it accordingly and not try to prevent it by giving another disease which may cause as much, or more, constitutional disturbance, and in some cases as long, or even a longer period of incapacity for work.

The results of vaccinia are not absolutely negligible and, unfortunately, whilst the number of deaths from small-pox is now certainly much over-stated, there is a possibility that those from vaccinia may be understated. Moreover, it is now recognised that in a certain number of cases recently the vaccination of children previously perfectly healthy has been followed by an obscure condition of encephalomyelitis which not uncommonly proves fatal.

Once again, I ask: "Is protection against the present type of small-pox worth the price which is being paid for it?" That it really is small-pox seems to be established by the fact that vaccination efficiently protects against it, and the official argument is that at any time it may develop into the original virulent Eastern type, and that in view of this possibility universal vaccination should still be enforced as far as possible. The answer would seem to be that the long-predicted epidemic of severe small-pox does not materialise, and that such limited outbreaks as undoubtedly have occurred in recent years have been controlled without difficulty by efficient quarantine and immediate vaccination of all contacts. In Leicester and many other large towns the proportion of those protected by vaccination must now be exceedingly small. Yet we do not hear of the occurrence of any serious outbreak of small-pox. That the matter really calls for careful consideration is clearly indicated by the recent Report of the Committee on Vaccination which was appointed in 1926. It recommends that a very modified form of vaccination be tried which, whilst it might not protect against small-pox for so long a period as the older and more drastic method, would at any rate not be likely to cause so much disturbance either local or constitutional, and might, therefore, become more generally acceptable to the population. Should this modified procedure be adopted the results will be awaited with interest. Evidently our views about vaccination are changing; they would probably change even more quickly had it not become a part of the official creed, established by law and therefore as dogmatic and as difficult to alter as the Athanasian Creed itself.

The Profession Self-enslaved.

Whilst, for reasons already given, I believe a medical autocracy would be thoroughly bad for the public generally, I feel equally sure that in the long run it would be equally injurious for doctors themselves. It is often the case in life that the most disastrous thing which can happen to a man is to be uniformly successful in the attainment of his ambitions, and there is no reason why medical men should be exempt from this rule, even were it conceivably possible for them to reach their ideals and so control in large measure—however beneficently—the lives and destinies of their fellow creatures. Such a change could, of course, only be brought about by a most complete organisation and by the closest possible alliance with the State. The result would necessarily be that, however much power the medical profession as a whole might acquire, its individual members, even those most highly placed, would merely be slaves in or of the organisation they had created, having implicitly to obey its rules and conform to its methods, entangled in ever-growing coils of official procedure and red tape. Individualism, at present I consider one of the chief glories of medical practice, would be destroyed; to an increasing extent we should become mere automata, acting within narrowly defined limits under the guidance of orders of superior officers whom, in our own interest—for purposes of advancement and so on—it would be essential always to conciliate. Even the head of the entire professional organisation, presumably the chief medical officer of the Ministry of Health, would no more be a free man than is the Pope, the self-made prisoner in the Vatican. He would be hampered in every direction by precedent, custom, and tradition. All life, all initiative would be extinguished, originality would be discouraged, research, as I have already pointed out, confined within strictly defined limits, and in enslaving others we should ourselves become the greatest slaves.

For two things we need constantly to strive, the first is humility—for an acute realisation not so much of the comparatively little we know as of the enormous extent of our continued ignorance; to realise also how many and insidious are the pitfalls which ever beset us alike in diagnosis, in prognosis, and in treatment; how easy it is to draw false deductions and especially, because it enhances our intellectual pride and our reputation with others, to attribute to our own skill that which is really due to nature. We are probably only too apt to think anything new arising outside our own ranks must necessarily be worthless. The danger is that any body of men who acquire knowledge, especially about the human body, much beyond that possessed by the rest of mankind, are apt to give themselves quite unnecessary airs of superiority which, in the long run, certainly do not win for them the respect or esteem of their fellows.

The second object at which we should constantly aim is the maintenance of our freedom. How true is the old saying that the price of freedom is eternal vigilance, whether it is personal, religious, political, or professional freedom. Man is so constituted that, as I have pointed out already, he is always trying to gain control over his fellow men. In medicine this can only be effected by close alliance with the State, in other words, by means of a State Medical Service in a Socialist commonwealth. This entails the extinction of individualism and the loss of freedom, with all its paralysing effects on originality and progress. No gain can possibly be commensurate with so great a loss.

ROYAL SOCIETY OF MEDICINE.

SECTION OF THERAPEUTICS.

A MEETING of this Section was held on Oct. 9th, when Prof. J. A. GUNN read a presidential address, opening a discussion on

CARDIAC STIMULANTS.

Prof. Gunn said that confusion occurred owing to discrepancies between the clinical findings and the pharmacological evidence in regard to a number of substances, but in regard to certain drugs which were usually included in the class of cardiac stimulants the confusion was especially pronounced. There had been little agreement between clinicians and even less between pharmacologists. He had consulted text-books with the object of arriving at what was the general opinion on the points at issue, but it was remarkable that, in spite of the quantity and quality of the researches made in recent years, he found scarcely anything which could be regarded as a real consensus of opinion on the therapeutic value of the drugs in this group.

The circulation of the blood could be regarded as a distributory scheme designed to supply the organs of the body with blood, with all that that fluid implied, according to the separate demands of each organ. If the composition of the blood was normal the crux of the sufficiency of the circulation in any organ was the rate of flow of the blood through it; it depended on the pressure of the blood and the calibre of the vessels. The collecting side of the circulation was of equal importance, because if the continued uniformity of the circulation was to be maintained, as much blood must be returned to the heart as was pumped out of it in a given time. It was long before he realised that the important part of the circulation was the capillary part; it was, indeed, for this that the circulation was designed. Broadly, physiological research had proceeded from a consideration of the wholesale distribution to the return delivery. Here, as in other matters, research had proceeded along the line of ease of observation, and especially ease of measurement. Two of the most difficult aspects were the capillary circulation and the venous return.

In considering cardiac failure and cardiac stimulants, it was first necessary to ask whether the physician and the pharmacologist had brought themselves into line with the advances in knowledge concerning the circulation; and the answer to that must be "not yet." There was a tendency very prevalent just now to apply to a case the term "cardiac failure" when the heart condition had nothing to do with the failure of the circulation, though of course every failure in circulation was reflected in the heart beat.

The Need for Classification.

Much of the present confusion as to cardiac failure and cardiac stimulants was due to a lack of proper classification, without which no real progress could reasonably be expected. An example of his meaning he drew from his own experience. Twenty years ago he had a prolonged fainting attack, due to undisciplined smoking. His pulse-rate was 40, and he regarded his case as one of vagal stimulation. The large dose of belladonna which he took promptly changed the pulse to a reasonable rate. Now inhalation of ammonia was used as a cardiac stimulant and it was a powerful stimulator of the vagus centre; in his own attack, however, the use of ammonia would have made matters worse. Again cardiac failure might occur early in chloroform administration, or from ventricular fibrillation, or late in chloroform administration from paralysis of heart muscle with central vasomotor and respiratory paralysis. In the first kind adrenalin, if it could be got to the heart, would do more damage than good, while in the second kind it might save the life of the patient. One of the most dramatic improvements he had seen occur in the pulse was that which followed the intravenous injection of pituitary extract in a case of intestinal atony. But pituitary extract exerted no effect on the heart; its action was on the small arterioles and on the capillaries. Thus it was necessary to separate out the cardiac failures and also the cardiac stimulants. The utilisation of present knowledge, as well as the making of further advances, was being seriously handicapped by the want of a proper classification.

No classification of cardiac stimulants was possible unless the term was accurately defined and realised. Usually a stimulant was understood to be something which produced a prompt but transient increase of activity of an organ; though under conditions in which such a fillip might break a vicious circle, the effect might be lasting. A tonic meant something causing increased activity or tone, which was brought on more slowly and was more enduring. Prof. Gunn then proceeded to consider some of the drugs which had been regarded as cardiac stimulants and to suggest possible explanations for the present discrepancies of opinion in regard to them.

Strychnine.

It was agreed that under certain circumstances this drug caused increased excitability of the central nervous system, and of the vasomotor and respiratory centres especially. It was equally agreed that strychnine had no direct action on heart muscle, for instance, on the perfused heart. He had seen astonishing improvement in the pulse and circulation ensue in an almost moribund patient following upon the injection of gr. 1/8 of strychnine. But how did it act? Not on heart muscle, and he did not think strychnine ever saved a life. It raised the aortic pressure and drove that added quantity of blood through the organs which was needed for the immediate continuance of life. The heart was improved by increasing the supply of blood to the coronary vessels. There was a lack of agreement as to when—if ever—it should be used, and as to what was its therapeutic value. It was useless to employ strychnine except when the primary failure was vascular, not cardiac. The reaction of the nervous system to stimulation depended on its state of excitability at the time. If the vasomotor centre was so depressed—as by the action of toxins—strychnine might have little or no effect. If the vascular failure was capillary stasis, or if the vessel walls had lost their excitability, stimulation of the vasomotor centre would not accomplish anything. With regard to dosage, it had been said that less than a dose of 1/10 of a grain was of no use; the only effect he had seen follow the use of the drug was when it was given in doses of gr. 1/10 to 1/8.

Alcohol.

On this drug the literature was a vast one. The antagonistic views with regard to its action were due to the fact that it had been administered in two different ways. Small amounts of whisky and brandy had been given for faintings in more or less healthy people, and he agreed that some improvement in the circulation followed this practice. The effect occurred too soon for it to be due to its influence after absorption; it must be a reflex effect, for in this concentrated form it must cause cerebral stimulation. That neat brandy caused no marked reflex effect on the healthy person did not mean it would have no effect on a patient who was semi-conscious. And though brandy might cause a reflex effect on the medullary centres in temporary circulatory failure, it did not follow it would have the same effect on a patient with the gradual circulatory failure which was associated with a long illness. Most pharmacologists believed that alcohol had no direct stimulant action on the heart, and experiments had shown that it did not markedly influence blood pressure. It was undoubted, however, that alcohol after absorption caused some redistribution of the circulation; the flushing effect was easily seen. When absorbed it was not clear that alcohol altered the blood pressure. Prof. Gunn objected to

the statement so often made that though a drug might not do good, it would not do harm; a drug did not leave matters as they were.

Camphor.

A corresponding dispute had arisen as to the effects of camphor: there was an extensive and contradictory literature on the subject. Camphor had been largely used as a stimulant in circulatory failure. There was no evidence of its direct action on cardiac muscle. When injected hypodermically it acted as a local irritant and reflexly stimulated the medullary centres. It had the same limitations as alcohol. It was held to have a beneficial effect on the circulation after it was absorbed, but views on this differed acutely. It had a dilating effect on the coronary and the skin vessels.

Adrenalin.

Here the pharmacologist was on firmer ground. Adrenalin had the same action in health and disease; it was a peripheral sympathetic stimulant, and the most powerful known stimulant of the heart. It contracted most of the arterioles, so that injection of it caused a prompt, steep, and high rise of blood pressure. There was a constriction effect, mainly on the splanchnic vessels, and those of heart and lungs were dilated. In conditions in which a low blood pressure and a feeble heart were injurious, adrenalin, by altering the blood distribution and increasing the cardiac output, might cause a lasting improvement in the circulation. Its action was independent of the condition of the central nervous system at the time; in the case of tissue which had been kept in cold storage, as long as the muscle was alive adrenalin would still show some action. Adrenalin was, however, a two-edged weapon. It acted best when given intravenously, and in a slight overdosage it was a powerful poison, throwing a heavy strain on heart and vessels. Therefore its use had been confined to cases of forlorn hope. It had been used repeatedly, often with success, for complete or threatened arrest of heart. Probably increasing familiarity with its action would enable it to be given as repeated injections for acute cardiac failure.

Pituitary Extract.

The action of this drug was relatively simple. It contracted the capillaries and small arterioles, not discriminating between the splanchnic and other vessels. It had no action on the heart. In regard to the circulation, it was useful only when it was desired to contract the arterioles and the capillaries. In capillary paralysis, pituitary extract had no effect, although in some patients it might bring about a transient improvement in the circulation.

A Better Terminology.

How should a cardiac stimulant be defined? Various definitions were possible—e.g., (1) It could be defined as anything which would improve the output of the heart, and would include substances which had no action on the heart at all. (2) It could be stated to be anything which caused increased ventricular action in a heart acting under constant dynamic conditions. This last was the desirable definition. There was no reason why syncope should be classed as cardiac failure, whether due to overaction of the vagus or to dilatation of vessels. Prof. Gunn looked forward to the time when descriptions of diseases would no longer include mention of "cardiac failure," substitutive terms being "paralysis of heart muscle" or "paralysis of vasomotor centre," or "of the capillaries"—whatever the primary trouble might be, with a corresponding improvement in therapeutic practice.

Discussion.

Dr. KINGSTON BARTON, speaking as one who would be called a non-alcoholic doctor, asked how it was that a faint or exhausted patient quickly revived when given a stiff dose of brandy. Doubtless it was, as the President said, by causing a redistribution of the blood. A free dose of brandy every half hour during the crisis in pneumonia would similarly restore the patient to obvious life.

Dr. G. A. SUTHERLAND said his view had long been that there was no such thing as a cardiac stimulant, and Prof. Gunn seemed, as the result of his experience and his experiments, to hold that view also. The term was really a misnomer. A liver stimulant meant an agent for promoting the flow of bile, but that had no parallel in the case of the heart, which had many structures, nervous, conducting, muscular. In heart failure it was necessary to consider which part of the heart was affected. Adrenalin acted chiefly in disturbances of the conducting tissue. He did not think any known drug would go direct to the heart muscle and stimulate it.

Dr. JOHN PARKINSON said the point under discussion would be decided by settling the requirements of individual varieties of cardiac failure. He thought sudden circulatory failure should be subdivided. One knew the ordinary cardiac failure accompanying auricular fibrillation, cardiac failure without such fibrillation, with auricular flutter, and with paroxysmal tachycardia. The subject would be simplified when it was known when and how patients got sudden circulatory failure. But there was a special difficulty in applying remedies in such conditions owing to Nature's care of the heart. It could cease to beat for a long period, and yet repeatedly recover itself. Moreover, Nature had shown herself capable of doing all that the physician hoped to do by means of the alleged cardiac stimulants; sometimes the patient in an acute condition had recovered before the arrival of the specialist. If a patient was collapsed from auricular fibrillation quinidine might prove to be exactly the remedy required to restore the normal rhythm, though it was not regarded as a cardiac stimulant. With regard to alcohol, that it had an effect on the circulation after absorption was quite evident from the flushing, and its use for so long a time seemed to have been justified especially in continuous failure.

Prof. E. B. VERNEY agreed it was important to divide cardiac muscular stimulants into the two chief groups; (1) those having a direct action on cardiac muscle; (2) those which improved the condition of the heart muscle by increasing the arterial blood pressure, leading to an increase in the coronary flow. It was also necessary to define accurately what was meant by the term "cardiac muscular stimulant." He drew attention to the views of the late Prof. Starling on this subject. Starling's idea was that such a stimulant was one which caused the heart to perform the same amount of work on a shorter length of fibre. On this conception adrenalin could be regarded as a cardiac stimulant.

Dr. T. IZOD BENNETT declared his belief in camphor given intramuscularly as a cardiac stimulant, but it should be used in a dosage of grs. 20 to 30 at one administration. Strychnine he considered of value in circulatory failure, but chiefly in the type of case in which there was marked cerebral depression.

Dr. D. E. BEDFORD criticised the nomenclature under which various remedies were set out in the medical journals, remarking that it was a pity that the purveyors of medicines did not describe more accurately the substances they were advertising. In his hands most of them had been useless. From the practical point of view, by "cardiac failure" one meant (1) congestive failure, (2) sudden collapse.

The PRESIDENT, in his brief reply, asked that the clinician should try to subdivide his cases a little more. In making comparisons it was necessary to be sure of the dosage.

PAYING PATIENTS AT GOLDEN SQUARE HOSPITAL.—Twenty rooms for paying patients are about to be opened at the Throat, Nose and Ear Hospital in Golden-square, W. There will be a charge of 6 guineas a week with "a moderate fee" to the surgeon.

Reviews and Notices of Books.

ADDRESSES ON SURGICAL SUBJECTS.

By Sir BERKELEY MOYNIHAN, President of the Royal College of Surgeons of England. London and Philadelphia: W. B. Saunders Company. 1928. Pp. 348. 28s.

Sir Berkeley Moynihan has collected in this volume a number of addresses and essays of which many will be known already to regular readers of current medical journals, and it is a tribute to his skill, both as orator and essayist, that the new and the old are alike interesting and pleasantly easy to read. There is a unity of theme running through the whole of this book which is due partly to the fact that the author is propounding his faith in surgery and surgeons, and partly to the fact that all the essays, with one exception, first appeared in the years 1925–27. The author apologises in his preface for the fact that there is a certain amount of repetition; but no apology is necessary, as the repetitions indicate clearly the trend of his thoughts on surgery and his admiration for the surgeon and investigator who, more than any other, seems to have captured his imagination. It is natural that the name of Lister should appear prominently in a series of addresses, of which some were delivered in connexion with his centenary celebrations in 1927. But Lister and his work are quoted quite apart from the centenary celebrations; and it is hardly too much to say that this is a volume of praise of Lister and of the work which made modern surgery possible and safe. An oration which stands alone by reason of the time at which it appeared is the first Murphy Memorial Oration delivered before the American College of Surgeons in 1920. The impression that this was a great pronouncement is confirmed by a second reading. It is one of the finest portraits of a great man of a previous generation which has ever appeared to enrich medical literature. With the orator we do indeed see Murphy's tall, gaunt figure; and we almost feel the orator's surprise that this handsome man of Irish descent should have had a harsh and unpleasing voice—surprise, however, which was soon forgotten as the subject of his discourse fascinated the hearers.

There are four clinical lectures in the volume—on the perforation of gastric and duodenal ulcers, on the relation of aberrant mental states to organic disease, on acute pancreatitis, and on the gall-bladder and its affections. Each is an epitome of the author's experience of a disease or catastrophe of which he has an unrivalled knowledge. Cancer is dealt with in the Hastings Popular Lecture, and the layman could read no more scrupulous or careful exposition of the successes and limitations of medicine and surgery in its treatment and cure. The figures given, from the records of the Leeds General Infirmary, of the percentage of cures obtained by a radical operation in carcinoma of the breast, when the disease is still confined to the breast, prove once again that early operation gives an excellent chance of cure. These figures are very similar to those published in a recent report from the Ministry of Health after an independent investigation.

The publishers are to be congratulated on a collection of essays and addresses which are so characteristic of the author and of such permanent value.

MEDICAL INSURANCE EXAMINATION.

Modern Methods and Rating of Lives for Medical Practitioners and Insurance Officials. By J. PATERSON MACLAREN, M.A., B.Sc., M.B., C.M., J.P. London: Baillière, Tindall and Cox. Pp. 312. 16s.

THE problems of insurance medicine have now developed a very considerable literature; in America, indeed, there is a definite tendency towards specialisation in this branch. It is becoming increasingly recognised in this country that a medical examination for life assurance demands a careful and systematic routine, and that the assessment of damaged or substandard lives involves a more accurate knowledge of prognosis than can be acquired from an ordinary text-book. The function of the occasional examiner is to look at the proposer carefully, both in regard to his family and personal history, his physique, and the condition of all the systems of the body. He should then give an assessment of his general health, and of the significance of any departure from the normal. The function of the chief medical officer is to apply his greater experience and his knowledge of the actuarial studies of various diseases and their effects upon longevity, and so to suggest a rating, which, however, is often subject to review or modification after consultation with the actuary of the company. To produce a book which shall be of value to both these medical men is no easy task; Dr. Paterson MacLaren has succeeded in achieving it because his book is the outcome of his own difficulties in the early stages of this work. He gives valuable suggestions to the occasional examiner, demonstrates that insurance examinations and assessments are not matters of rule of thumb, and devotes much attention to the details of physical examination. Some of the material given is elementary, but it is none the less essential. The importance of accurate blood-pressure readings is stressed and especially the value of the diastolic pressure record. We would add to this advice that medical examiners should indicate the method employed to determine the diastolic reading. This record is now admittedly of great importance, but until some uniformity of method is adopted, the chief medical officer is bound to regard as suspect abnormal readings which do not fit in with the other observations of the proposer.

The section of the book devoted to diseases as insurance impairments is perhaps the most useful part. Valuable suggestions as to the "loading" to apply for special and individual diseases, defects, or operations are presented, and wherever possible, reasons are given or authorities are quoted. Combining as he does a good knowledge of the literature with practical experience, Dr. MacLaren has been able to produce a helpful book which we commend to our readers.

THE THEORY AND PRACTICE OF RADIOLOGY.

By BERNARD J. LEGGETT, M.R.C.S. Eng., L.R.C.P. Lond., A.M.I.E.E. London: Messrs. Chapman and Hall. 1928. Vol. I.: Electrical Theory and Applied Radiology; pp. 238; 18s. Vol. II.: The Physics and Measurement of X Radiation; pp. 307; 25s. Vol. III.: X Ray Apparatus and Technology; pp. 550; 42s.

UNDER this comprehensive title the author has endeavoured to compile a complete review of radiology, and so far as the first three volumes are concerned he has succeeded well. Vol. IV., which is to deal with diagnostic and therapeutic radiology, is still in preparation. The author has not included radium or radium therapy in his scheme, and has devoted three out of four volumes to the physical and engineering aspect of radiology, whilst the medical aspect is to be condensed into a single volume, which can hardly be so exhaustive as the first three. Vol. I. is a text-book of electricity and magnetism in so far as these subjects concern radiology. The author has not, as is so often done, endeavoured to eliminate the mathematical aspect, but has set it out in such a manner as to be comprehensible to medical men with a knowledge of and liking for mathematics. We venture to think they are more numerous than is usually assumed by authors of medico-physical literature, and it is obviously quite impossible to separate the physics of radiology from its natural and fundamental mathematical basis. In each chapter the author has included a series of questions, analogous to those set in the Diploma in Medical Radiology and Electrology and in the Membership of the Society of Radiographers examinations, which might have been

even more useful to the student had an appendix with answers been included in order that solutions might be checked. The volume is profusely illustrated with photographs and diagrams, and the text provides a clear account of the electrical principles underlying the physics and measurement of X radiation, which is dealt with in Vol. II. This second volume is particularly useful, as it brings together into one book the knowledge of physics required by the radiologist. Dr. Leggett has made a very thorough search for relevant material, and the book contains much interesting matter that it would be very difficult to find elsewhere. An appendix embodies the protection recommendations adopted by Britain, U.S.A., Germany, Sweden, and Russia. Vol. III. deals with X ray apparatus and technology, and here again the author has gone widely afield for his information. Descriptions of apparatus and the manufacture of apparatus, including high vacua tubes by manufacturers throughout the world, are included. This book is, however, very much more than an instrument-maker's catalogue, since it contains a vast amount of information on the use of the apparatus and the principles involved in its manufacture. The last third of the book deals with the radiological building, and contains a full description with plans of the large modern departments in Europe and America as well as those of this country. It is a section that will give much useful information to those designing and equipping an X ray department.

The work, when complete, should prove of great value to students and radiologists.

REQUISITES AND METHODS IN SURGERY.

By CHARLES W. CATHCART, C.B.E., M.A., M.B., C.M. Edin., F.R.C.S. Eng. & Edin., Consulting Surgeon, Royal Infirmary, Edinburgh; and J. N. JACKSON HARTLEY, O.B.E., M.B. Edin., F.R.C.S. Eng. & Edin., Surgeon, Cumberland Infirmary, Carlisle. Edinburgh: Oliver and Boyd. 1928. Pp. 476. 12s. 6d.

THIS is a book of somewhat novel scope. The authors state that it has been written as a guide for senior students, house surgeons, and general practitioners at home and abroad, and a first inspection of the contents suggests that it is another addition to the already long list of books on minor surgery. Closer inspection certainly shows that this branch of surgery is adequately presented, but the inclusion of chapters on post-mortem examinations, medico-legal subjects (including poisons and their antidotes), and even hospital economy justifies the claim to be more than a text-book of surgical methods. Some may feel that the authors have attempted to deal with too many subjects not essentially surgical, and that the book in consequence lacks the cohesion and balance which come from the careful consideration of a more limited field. But no young surgeon can read it without adding to his stock of useful experience.

MICROBIOLOGY.

An Elementary Text-book of General Microbology. By W. GILTNER, Professor of Bacteriology and Hygiene, Michigan State College. London: J. and A. Churchill and Co., Ltd. 1928. Pp. 471. 99 Illustrations. 15s.

IT seems to be a common event in the United States for a course of bacteriology and protozoology to be taken in a university career of general culture, and a number of text-books represent a line of teaching which is rare in this country. This volume gives a comprehensive survey of all the varied aspects of microbes and their activities, pure and applied. The most original thing about it is the author's preference for "microbology" as the name of his subject. For an introduction to the science of small life it is crammed with far too much detail; it would form the syllabus for a splendid whole-time course of lectures and practical work extending over about two academic years, but we fear it is hardly likely to be used in that way.

BOOKS FOR NURSES.

Gynæcology for Nurses. By HARRY STURGEON CROSSEN, M.D., F.A.C.S., Professor of Clinical Gynecology, Washington Medical School. London: Henry Kimpton. 1928. Pp. 281. 12s.

THIS book is written by a distinguished American gynæcologist "to present the details of gynæcological nursing in such a way as to be of real help to the physician in securing accurate execution of his orders in the care of those patients, and of real help to nurse supervisors in training their student-nurses." The first part gives a survey of pelvic anatomy, physiology, and pathology, and of the diseases of the pelvic organs and methods employed in their diagnosis and treatment, operative and otherwise. The second part presents the various aspects of the nursing of gynæcological cases, chiefly as carried out in the Barnes Hospital and Washington University Dispensary. The book is profusely illustrated; there is a picture for every day in the year, Sundays included.

The opinion to be formed of the usefulness of a work of this kind will be largely determined by the reader's view as to how a nurse should be trained. Now that this country has adopted the principle, for better or for worse, that a woman can only become a nurse by passing through the gateway of examinations, it must be agreed that this type of text-book has its place. Examinations apart, the many highly technical and complex procedures described therein will be of value to the small percentage of nurses who are cast for a part in a gynæcological theatre. What is to be feared, however, is that a smattering of book-learning and medical knowledge may be allowed to replace a lengthy apprenticeship in the observation and care of patients and that method of acquiring the details of nursing duties which consists of carrying them out frequently under strict supervision and discipline. The pictures of operative procedures, for the most part taken from the author's well-known Operative Gynecology, are, in our opinion, not required by a nurse, and we have grave doubts of any benefit obtained from histological sections of menstruating endometrium and such like, especially as the textual descriptions are too brief to be instructive.

The book will be useful to sister tutors and others engaged in training and lecturing to nurses. To some nurses it may be like a cookery-book to a cook; it will not make her a cook, but will help her on special occasions or for special purposes. The nurse must learn her work by the longer and more tedious process of doing it practically in a hospital with high ideals of service and a high standard of efficiency; with such training a book of this kind may serve its purpose; without it, all books are useless. Excellent as it is, its sphere appears to us a limited one.

Dietetics for the Nurse. By I. STEWART, S.R.N., Examiner for the General Nursing Council, Scotland; Sister Tutor, Victoria Infirmary, Glasgow. London: The Scientific Press, Faber and Gwyer. 1928. Pp. 200. 4s. 6d.

Miss Stewart has prepared a text-book of those elements of modern dietetic treatment which must be mastered by nurses preparing for State examinations. The subject is a wide one, and much information is amassed in small space. The first three sections of the book, comprising chapters on dietetic principles, digestion, absorption, metabolism, and food values will require concentrated study on the part of the average student if she is to grasp the facts set forth. Many students would find them so closely packed with scientific terms as to be difficult to assimilate intelligently in the limited time available for study, unless the book followed out instruction previously given in lectures, which it is evidently intended to do. Having mastered these difficult sections, the reader will pass on gratefully to the chapters on diet in disease. These should be of great value to the nurse in helping her to follow

with intelligence the treatment being carried out upon patients in the wards around her. Every nurse—and the author particularly mentions the home nurse in her preface—will be glad of the numerous recipes provided at the end of the book. There are also interesting tables of comparative food values and contents, which will be appreciated by the more advanced student. A good index completes a little book which is sure to be useful, not alone to nurses beginning their career, but also in perhaps greater degree to ward sisters who wish to keep abreast of modern teaching.

Text-book of Anatomy and Physiology for Nurses and Masseuses. By R. H. ROBBINS, M.D., B.Ch., M.R.C.S., L.R.C.P., M.A., Assistant Lecturer and Senior Demonstrator, Anatomy Department, St. Mary's Hospital. London: Same publishers as above. 1928. Pp. 411. 10*s.* 6*d.*

BASED as it is on the requirements of the syllabus of the Chartered Society of Massage and Medical Gymnastics, this book should be highly acceptable to those preparing for these examinations and should at the same time make a ready appeal to nurses entering for the State examination or the diploma in nursing. To deal adequately with both anatomy and physiology in one small volume is not easy, and it might have been better to allocate a separate book to each subject or, alternatively, to expand the work. The appendices will be found useful and also the glossary of technical terms.

Materia Medica for Nurses. By A. MUIR CRAWFORD, M.D., F.R.F.P.S.G., Professor of Materia Medica, St. Mungo's College, Glasgow; Assistant Physician, Royal Infirmary, Glasgow. London: H. K. Lewis and Co., Ltd. Pp. 86. 3*s.* 6*d.*

THE virtue of this small book lies in the summary form of dealing with an exhaustive subject. One of the most interesting chapters is devoted to sources from which drugs are obtained, and forms a sound foundation upon which to base information as to their properties. Only those medicaments in common daily use have been considered, but references to vaccines, sera, and the important therapeutic substances obtained from the animal kingdom are included. This book is well arranged and its price brings it within the reach of every nurse.

HÆMOGLOBIN.

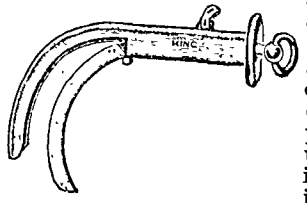
The Respiratory Function of the Blood. Second edition. Part II. Hæmoglobin. By J. BARCROFT. London: Cambridge University Press. 1928. With 63 Text Figs. Pp. 200. 12*s.* 6*d.*

Prof. Barcroft continues the instalments in which he is issuing the second edition of his book. This one deals with hæmoglobin as a chemical substance; it ends with a particularly clear illustration of the fact that hæmoglobin, as such, is not the same thing as hæmoglobin inside red corpuscles, and this aspect of the respiratory function of the blood is reserved for a third volume. Great advances have been made in recent years towards an understanding of the constitution of hæmoglobin, especially from the comparative point of view, and Prof. Barcroft gives an eminently clear, and what is more, readable account of the changes which have come about. It is particularly interesting to see how the pioneering observations of Dr. MacMunn, made in a shed at the bottom of his garden in the intervals of a busy practice at Wolverhampton, have at last ripened, along with those of Dr. H. C. Sorby, of Sheffield, into conspicuous new fields of knowledge. No one interested in hæmoglobin can possibly do without the book; it is not a complete encyclopædia for reference, but an informative account which cannot fail to stimulate further work. The provisional state of our present knowledge is clear.

New Inventions.

AN EXPANDING ARTIFICIAL AIRWAY.

THE expanding artificial airway shown in the illustration is designed to hold forward the base of the tongue and the epiglottis during the prolonged administration of anæsthetics. It is placed in position with the posterior ends in apposition, forming an ordinary flattened tube. By means of a small screw the posterior portion is then made to open, as shown in the diagram, the lower and anterior portion carrying with it the base of the tongue. Counter-pressure, to prevent the airway being pushed out of the mouth when it is opened, is secured by the projecting plate on the upper surface, which, being inserted behind the upper incisors, limits movement in a forward direction. Provision for edentulous patients is made by two holes, one on each side of the forward opening, wherein tapes can be inserted and tied behind the head. I have found this airway of the utmost value in long operations on the head and neck, where it is essential for the anæsthetist to be out of the way of the surgeon, and the necessity for the introduction of endo-tracheal catheters is thereby avoided in a larger number of cases. In addition, the clear airway ensured greatly increases the safety of the patient and the comfort of the nursing staff during the transport of an anæsthetised patient from the operating theatre back to bed, as the jaw does not have to be held forward constantly. It is necessary for the patient to be well under and properly relaxed before the airway can be introduced, otherwise some trauma may occur in introducing it, and the tongue, if rigid, is not gripped and pushed forward. Once in place, however, the airway will be found to be tolerated with a much lighter degree of anæsthesia.

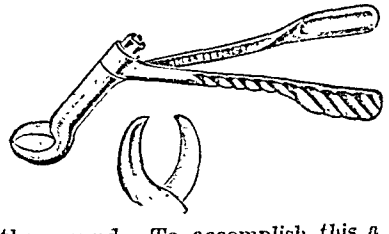


The apparatus is made by Messrs. A. Charles King, Ltd., 34, Devonshire-street, London, W.

REGINALD KARN, *M.C.*, *M.R.C.S. Eng.*
London, W.

BONE SHEARS.

THE principal point about the bone forceps here illustrated is that they have a shear action which enables one to cut the rib, leaving a perfectly clean uncrushed surface, and using the minimum of force. The character of the blades enables the blade to be inserted under the rib, even when the ribs are close together, with the minimum of risk of damaging other parts, and the blades can also be slid along the ribs under the tissues and so cut even at a distance, if necessary, from the wound. To accomplish this a right and left handed pair are necessary. The whole design gives maximum strength with a minimum weight.



The Holborn Surgical Instrument Co., Ltd., are the manufacturers.

H. MORRISTON DAVIES, M.D. Camb., F.R.C.S. Eng.
Ruthin, N. Wales.

A STREET-SWEEPER'S COLLECTION.—Mr. Edward Goodwin, a Derby street-sweeper, has, since 1919, collected £1750 for the hospitals of that town. He obtains the money by regular visits to clubs, public-houses, and football matches.

THE LANCET.

LONDON: SATURDAY, OCTOBER 13, 1928.

THE POSITION OF THE MENTAL DEFECTIVE.

"Existing institutions are full, and local authorities can no longer rely on charitable institutions or on the poor-law for this provision. Unless, therefore, they give immediate consideration to this matter the beneficent intention of the Mental Deficiency Act will be hampered and will almost cease to operate. We take this opportunity of making an urgent appeal for immediate action, and we do so the more confidently because every year reveals clearly the terrible consequences of the neglect to afford this means of protection."

"Unless a great effort is made in the immediate future to meet the constantly increasing demand for beds, it will become difficult and even impossible to administer the most important sections of the Mental Deficiency Act. . . . Once more this year we wish to impress on local authorities their responsibility for the degradation, crime, pauperism, and disease which must follow the neglect to provide suitable and sufficient accommodation."

THESE extracts are taken from the Board of Control reports of three years ago [1] and the present year [2] respectively. At the beginning of 1928 the institutions of the country dealt with 20,429 defectives. At the extremely moderate estimate of one in every thousand of population, the total number requiring institutional care is 39,067. Nearly twenty thousand persons, who could benefit by care and training if it were available, are committing crimes, begetting others feebleminded, drawing heavily on public money, cluttering up the workhouses, reformatories, prisons, and mental hospitals of the land and impeding the work of everyone in any way concerned with them. This calculation takes no account of the thousands more who do not require institutional care but only a certain measure of wise supervision. Ascertainment is speeding up, and the number of defectives of whom the local authorities have obtained knowledge has increased in the last six years from 25,470 to 61,522; most of these are in trouble of some kind. The local education authorities are reporting more defectives every year, mostly trainable children of 16 or under. Now the process of recognition is not within sight of being complete; some authorities have hardly even commenced it, yet the January returns show that 1479 defectives are "awaiting removal to an institution." When the work is performed properly, this number will be far greater. Even more serious is the position of those defectives who have remained, some for long periods, without training or proper classification, in the "places of safety" to which they have been committed under the Act until a petition for their removal to an institution could be presented; that of defectives remaining in prison; and that of those who, for want of proper accommodation, encumber the wards of mental hospitals. The waste of time and money which the presence of these persons entails on institutions quite unfitted to deal with them is incalculable.

The solution to the problem has been suggested in detail by the Board of Control again and again, and no one with claim to intimate knowledge doubts its validity. It is the provision by local authorities of farm colonies, of which there are many successful examples in the country. The reasons why it is not being put into practice are twofold. In the first place, while it would be foolish to deny that money is very short in probably every municipality in the kingdom, it is certain that the importance of the aim deserves a far greater expenditure than is at present allotted to it. But the failure of the local authorities to make the necessary provision is presumably, as the Board says, not entirely due to the shortage of money. In their experience it is sometimes due to a failure to realise the importance and gravity of the situation. The public see the necessity for treating florid mental illness; incipient mental disorder and mental deficiency escape their notice. They do not realise that mental deficiency is one of the most prolific sources, if not the most prolific, of practically every evil that besets the community. Perhaps the most conspicuous indication of the national blindness to its own vital interests in this matter is the tendency of magistrates and other responsible persons to allow, or even to encourage, the marriage of mental defectives. The Board publish a striking table, showing how six marriages in which one partner or both was defective produced 29 children, every one of whom became a source of anxiety and expense to relatives and State. The work of the voluntary bodies, especially that of the Central Association for Mental Welfare, is above praise, but these organisations cannot be expected to win the battle unaided. The time has come for new and stringent legislation, and for the establishment of a department of State to organise the provision of institutions throughout the country, giving financial assistance and advice to those authorities who require it, but also empowered to enforce the necessary steps, where they see fit, within a reasonable time. One of the most important and immediate of its duties would be an energetic educational campaign. It is, of course, not to be supposed that all or even a considerable number of local authorities are cynical, supine, or wilfully blind. They are for the most part composed of conscientious men and women who render much hard and ungrudging service to the community. A letter from the Chairman of the Flintshire County Council, which appeared in the *Times* for Oct. 9th, complains that two reasons have prevented his authority from taking action: (1) the Board of Control have been far too particular in approving of the accommodation which a local authority has proposed to find; and (2) the percentage of defectives who can be cured is very small, less than 5 per cent. The Board, he says, want all institutions to be of the superior, or curative, sort. The local authorities want to get accommodation for the incurable 95 per cent. at a reasonable cost, about £100 a bed, where the patients can be kept happy by ordinary sympathetic persons, and to transfer the few curables to a special institution. The writer seems to miss the point of the Board's requirements. The Board does not lay much stress on the possibility of curing defectives, but it wants to ensure the proper care, which, it holds, can only be institutional, of the forty thousand defectives who in any other environment are a danger and a disgrace to the community. The letter provides first-hand evidence that even enlightened local authorities do not appreciate the necessities of the position. It evinces, moreover, a strong distrust of the soundness of the Board's views. A central executive authority, by arranging for the full ventilation of the opinions of both sides, could greatly

[1] THE LANCET, 1925, ii., 655.

[2] The Fourteenth Annual Report of the Board of Control. Summarised on p. 773 of our present issue.

reduce friction of this kind and ensure the spread of that knowledge without which no local efforts, however conscientious, can be properly adapted to the necessity of the position.

THE SURGERY OF DEFORMITY: A SWING OF THE PENDULUM.

BEFORE the days of Lister, orthopædic surgeons confined their operations to those which were practicable by the subcutaneous method, and their successes were then largely attributable to patient gradual correction by means of apparatus, aided by subcutaneous sections of soft parts or bones. The introduction of the antiseptic and later of the aseptic method did away with most of the necessity for subcutaneous surgery and orthopædists were soon vieing with each other in devising and practising operative short-cuts to the correction of deformity. Their intention was to save much suffering and loss of time, likewise attaining more permanent results, and the pages of surgical journals in Europe and America during the last 50 years bear ample witness to the progress made. The surgery of muscles and tendons in relation to infantile paralysis has attracted a large share of their attention, and when Mr. NAUGHTON DUNN chose this subject for his presidential address to the Section of Orthopædics of the Royal Society of Medicine last week[1] he was able to raise some very lively issues. At the actual details of treatment for restoration of function he glanced but lightly, and the outstanding feature of his address was the conclusion that division of tendons or muscles is seldom necessary for correction of deformity. He did not intimate that this view represented a change of opinion in his own case, for as he said he was trained in a school in which gradual correction of deformity gave strikingly successful results. But it was otherwise with a number of speakers who took part in the discussion of the paper. One after another they arose and like converts at a revivalist meeting announced their conviction of sin, their repentance, and their determination to do better in future. With equal courage and candour they confessed that in the past they had operated unnecessarily or too often, and that they were determined in future to operate less frequently, in such conditions, for instance, as contraction of the hip. One speaker alone seems to have been faithful to the principle of immediate correction of deformity, standing fast in the advocacy of operation, and the remarkable conversion of his colleagues during the last few years perhaps justify him in wondering what their opinions may be when a few more years have passed.

The active orthopædic surgeons of to-day, some of whom only began to study the specialty during or even since the late war, have been accustomed to see open operations for nearly every deformity in which division of contracted and resistant structures seems to be needed. They have not perhaps realised that great success was achieved by their predecessors with older methods, and now that they have rediscovered the principles on which their professional grandfathers acted, they are (as it seems to us) in danger of allowing the pendulum to swing too far in a reactionary direction. This reaction goes beyond the limits set by subcutaneous surgery. It is not only a deprecation of open operations on bones, muscles, and tendons which was announced by the President and approved by most of the subsequent speakers, but an abnegation, in the treatment of most cases of contraction, of every kind of operation, except perhaps manipulation—and even this exception was not quite explicit. We are tempted to speculate on the causes of this striking change of theory and practice. It seems possible that there may lately have been a great decrease in the number of cases of severe post-paralytic contracture, since the attention of practitioners and Red Cross nurses has been drawn to deformities by the useful propaganda and teaching of the Central Committee for the Care of Cripples and the establishment of orthopædic clinics all about the country. As a result of this organisation and teaching, treatment is given in the early stages of deformity and contraction of a high grade is no longer allowed to develop. Is it not more than likely that cases of very severe deformity—say of the hip-joint, which was taken as typical in the discussion on Tuesday—which were not uncommon before the war, are now rare? If this supposition is correct it may well follow that it is not so much the orthopædic surgeon who has changed, as the usual type of contraction. If so, our anticipations of a return swing of the pendulum may not be fulfilled.

[1] For report see THE LANCET, Oct. 6th, p. 702.

SECURITY OF TENURE.

PUBLIC medical appointments carry a prospect of regular life, settled pay, and a pension at the age of retirement, which may compare favourably in the mind of the young medical graduate with the irregular life and uncertain income of the independent practitioner. A correspondent who has noticed the amount of space devoted to a description of these public services in our recent Students' Number would have us issue a word of warning to those who contemplate entering them that there is a snag. The aspirant should first of all find out what security of tenure is offered. In the large number of public appointments at present held under local authorities, even though there may be an obligation to contribute to a superannuation scheme, there is, writes our correspondent, no security of tenure whatever. Furthermore, the doctor in such public services places his professional reputation in the hands of an authority which is not obliged to give any reason for his sudden dismissal, and the dismissed medical officer has no legal redress, however his reputation may suffer thereby. In calling our attention thus to local authorities he has in mind not merely boards of guardians, councils of counties, county boroughs and towns, but their accredited agents, such as public health, watch and asylum visiting committees. Ever since the Local Government Act of 1834 the central authority has been shy of becoming involved in matters of local administration, and it is a fact, our correspondent states, that local authorities generally cover themselves from the risk of appeal to the Ministry of Health by the insertion of a three-months-notice-on-either-side clause in their approved standing orders.

It is, we agree, imperative for any medical man or woman entering a public service carefully to scrutinise the terms of any contract made, so that the medical officer may know exactly where he or she stands. In all such appointments there is presumably a contract of service, and this contract presumably contains provisions for the termination of the appointment on either side. But the tenure of certain public offices was placed on a more secure footing by the Public Health (Officers) Act of 1921, whereby it was enacted that the medical officer of health of a

local authority who, by the terms of his appointment, is restricted from engaging in private practice as a medical practitioner, should not be appointed for a limited period and should be removable by the authority only with the consent of the Ministry of Health or by the Minister and not otherwise. This provision, however, holds only for the actual head of the department and then only if some portion of his salary is paid out of moneys voted by Parliament or is chargeable to the Exchequer contribution account. Nor does the Act of 1921 apply to Scotland or Ireland. Further, it is provided by Clause 4 that nothing in this Act shall prevent a local authority from making, with the sanction of the Minister of Health, a temporary arrangement for the performance of all or any of the duties of a medical officer of health, and any person appointed by virtue of such arrangement to perform these duties or any of them shall, subject to the terms of his appointment, have all the powers and liabilities of a duly appointed medical officer of health. Poor-law district medical officers and medical officers of workhouses hold office, it is understood, until they die, or resign, or are proved to be insane, or become legally disqualified to hold such office, or are removed by the Minister of Health.

There are, however, a large and increasing number of medical officers in the service of public bodies who have not even the security of tenure provided in the Act of 1921. In many cases the conditions under which they hold appointment can only be discovered by reference to the advertisements inviting application or after specific inquiry. When the post in question is a whole-time one this complete lack of security may prove a serious matter, for a medical practitioner who has spent a large part of his life in a post of this kind may find it difficult to make a fresh start. When the post is a part-time one its loss is not so serious. Security of tenure concerns not only the officer himself but also the public welfare, for in cases where a medical officer in the discharge of his duties is likely by his action to affect the interests of members of the public body whose medical officer he is, it is obviously contrary to the public weal that he should have any ground to fear dismissal for the efficient discharge of his duties. Police surgeons are liable to supersession by the watch committees of their district, and there have been instances in which the surgeons appear to have lost their posts as a result of giving evidence which did not support the contentions of the police. Among the numerous medical posts now held under public bodies are those in mental hospitals and public sanatoriums, where the interests of the governing bodies are not so likely to conflict with the proper discharge of their duties by the medical officers, but in which insecurity of tenure renders them more liable to injury arising out of jealousy or intrigue on the part of fellow officers. In accepting appointments under public bodies, therefore, careful attention should be given not merely to the amount of salary offered, but to the position as regards pension or superannuation. It is prudent to be aware of such curious anomalies as that affecting poor-law medical officers, according to which the guardians may, if they wish, make an allowance to a medical officer dismissed for misconduct, but not to a medical officer who voluntarily resigns—a state of affairs which involves hardship where a medical officer leaves a neighbourhood for the sake of his wife's health or some similar reason. Information on these various heads is not easy to come by, and although the medical defence societies keep these matters constantly in view, and no doubt instances of summary dismissal are likely to come to their immediate notice, there are many implications of insecurity of tenure which are not amenable to rules of conduct and yet are liable to affect the comfort and happiness of the public medical officer.

Annotations.

"Ne quid nimis."

THE MÉDECIN-CHEF.

THE entertaining address by Dr. Walter Carr, which we publish on p. 753, is largely a plea that our profession should no longer seek the sceptre and the glittering prize, but rather gain the satisfaction that comes from doing small things efficiently. The chief seats at the feast, he seems to think, are no place for the medical man: and he will doubtless be glad to read our American correspondent's report that every student at the Johns Hopkins Hospital is now obliged to take a course in cookery in the hope of making him fit for a less ornamental rôle. Nor is this addition to the medical course without enthusiastic champions in Europe, for the question was raised only a few weeks ago by a writer in the French medical press.[1] Lack of knowledge of the culinary arts, he said, is a serious defect in a physician's training. The importance of cooking in relation to the nutritive value of food has been proved again and again, but this knowledge is very little applied. If a patient himself is ignorant and if his doctor is unable to advise him, his "cure" or otherwise will often rest in the hands of some ignorant woman whose notions are borrowed from the fried-fish shop. Yet all one needs, declares this engaging Frenchman, is to apply the basic principles of chemistry and physics to food and its preparation. The result is a new science which he terms "gastrotechnics," and which he summarises for the use of doctors under six headings—boiling, frying, roasting, steaming, mixing with starch, and mixing with yolk of egg. If these six principles, which he explains in detail, are fully understood, all the rest is perfectly simple. It may take an Escoffier ten years to learn how to cook a sole meunière worthy of the name, but a doctor is a scientist whose training should enable him to seize the fine points of the art in no time. Here, then, is an opportunity for those who are burned by Dr. Carr's satirical criticisms and long to show their competence in really useful spheres. The task is evidently easy, and the necessity for undertaking it is unassailable. The physician who neglects his duties as a dietitian is not a good physician. No one can be a good dietitian if he knows nothing of cooking. And from this it undoubtedly follows that the lack of good cooks in our profession must be regarded as another standing reproach against the General Medical Council.

HEALTH OF THE R.A.F.

THE Report on the Health of the Royal Air Force for 1927[2] records a satisfactory advance in sanitation and the handling of tropical diseases. It also includes the new and judicious programmes for the education of medical officers upon their appointment, and for the training of laboratory assistants, so that they may be worthy of similar employment in civil life when their time expires. All flying officers, it is pointed out, must pass in hygiene before promotion to the rank of squadron-leader, and all drafts (officers and other ranks), before proceeding abroad, are shown health appliances in the newly formed hygienic museum at Uxbridge; these demonstrations arouse great interest, and voluntary visitors to the museum are numerous. The total force was 30,123 (including 3302 officers), and illness has on the whole been

[1] Presse Médicale, March 17th, p. 349; Aug. 22nd, p. 1067.
[2] H.M. Stationery Office. 1928. Pp. 86, 4 plates. 3s.

reduced. Influenza increased, but preventive inoculations appear to have given encouraging results. A scarlet fever epidemic was extinguished with the aid of a "bed spot" map, and a threatened diphtheria outbreak was suppressed after Schick-testing and immunisation. The total death-rate was 4·2 per 1000 (1·5 from disease, 2·7 from injury). From duty flying there were 52 deaths (78 in 1926), and 81 other casualties (101 in 1926). The casualties from flying were the lowest for four years, and the lowest ever recorded in relation to the number of aircraft hours flown. There were 81 deaths from accident, and 45 from disease, tubercle accounting for 9 (7 pulmonary), pneumonia 7, typhoid 4, appendicitis 3, and malaria 3. The number of invalidings was 185, of which 28 were attributed to psychoneurosis, 23 to tubercle (21 pulmonary), and 21 to accidents. Of the men with tubercle, only 7 had seen less than four years' service, the prevalence rates by age for the Force being: under 20, 0·4; under 30, 0·1; under 40, 1·6; over 40, 8·0 per 1000. Comparison with the other services would be easier if ages were grouped in the 5-year periods of the Registrar-General. Of the total injuries a third are put down to athletics, the most common and serious damage being synovitis of the knee. The report contains an account of the principles of the medical examination of pilots, and it is claimed that the success of Imperial Airways (2,400,000 miles flown and 54,000 passengers carried without serious accident in three years) proves the soundness of the medical selection of the pilots, which is carried out by the Air Force Central Medical Board. Many other interesting facts and figures are recorded, and the Medical Director's department is to be congratulated on bringing out the report within nine months of the end of the period to which it refers. This is a distinct advance on previous years, and we hope that the acceleration will be maintained.

THE ANTI-HÆMOLYTIC POWERS OF LIVER.

ALTHOUGH the efficacy of liver and its extracts in raising the red cell count in pernicious anæmia is universally admitted, the reason why they do so remains as much a mystery as ever. M. Weinberg and J. Alexa,[1] of Paris, offer as an explanation the anti-hæmolytic power of liver extracts. Adopting the view that the abnormal blood destruction, which is one of the characteristic features of pernicious anæmia, is due to the action of hæmolysins, probably bacterial in origin, they tested the power of aqueous extracts of liver to inhibit the action of these blood-destroying agents. As *Bacillus welchii* has for many years been accredited with some causative rôle in pernicious anæmia, and as this organism provides a powerful and easily prepared hæmolysin, they used *welchii* toxin for most of their experiments, and they found that admixture of liver extract with the toxin inhibited its hæmolytic action both in vivo and in vitro. In vitro they found that 0·1 c.cm. of an aqueous extract of liver was sufficient to prevent the hæmolysis of 3·5 c.cm. of a 5 per cent. suspension of red cells by 0·1 c.cm. of the toxin, an amount which, in the absence of the extract, caused rapid and complete destruction of the red cells; in vivo they found that admixture of an equal bulk of liver extract with a lethal dose of toxin never failed to prevent the hæmolysis which always appeared in control animals. Similar results were obtained with hæmolysins prepared from *B. coli*, staphylococci, and the *vibrion septique*. In view of these results Weinberg and Alexa suggest that a trial should be made of the effect of washing out the bowel of pernicious anæmia patients with liver extract. But as there is ample evidence that good results can be got by applying liver extracts to the intestinal canal from above downwards, it seems doubtful whether such retrogressive therapy will ever find much favour.

[1] Compt. rend. de la Soc. de Biol., 1928, xcix., 25, 567.

"THE NEW COAL AGE."

So much has been said of recent years on the advantages of low temperature carbonisation that we welcome the appearance of a journal devoted entirely to this subject, the policy of which is stated to be summed up in the phrase "Scientific fuel is the fuel of the future." The journal announces that it will represent no party, no group, and no financial interest, and that its pages will be open to explain, describe, and discuss all processes and all forms of scientific treatment of coal. If this policy is adhered to it should fill a long-felt want. The development and increasing use of low temperature coke must have a profound effect upon the health of the people, since in this way an immediate reduction of the smoke pollution of the air of our cities might be made. The treatment of coal by low temperature carbonisation provides not only a solid smokeless domestic and industrial fuel, which can be used in the powdered form, but also is a source of oil for fuel and lubricating, motor spirit, fertilisers, and acids. In addition, a rich gas is produced during the process; indeed the disposal of this rich gas has been one of the problems confronting the makers of low temperature coke in the past, the difficulty being not so much technical as one of conflicting commercial interests. Finally, it is within the bounds of possibility that the development of low temperature carbonisation may give a new lease of life to the coal industry.

TREATMENT OF PNEUMONIA WITH CONCENTRATED POLYVALENT SERUM.

ATTEMPTS to produce a powerful specific remedy against lobar pneumonia have not been of much practical value, as it has only proved possible to make a serum for use against infections by pneumococci of type 1, and this in such low concentration that effective dosage is difficult. Even when the technical obstacles of administration have been surmounted the beneficial effects have not been altogether convincing, and the more interest therefore attaches to a paper[1] in which Dr. R. L. Cecil recently communicated to the Massachusetts Medical Society the good results he has had at Bellevue Hospital with what is known as Felton's serum. First made by Dr. Lloyd Felton about three years ago, this is a polyvalent product prepared by immunising horses against pneumococci of types 1, 2, and 3. The serum is taken from the animals in the usual way, but by precipitating the immune bodies with distilled water and then redissolving them in a concentrated form, it is claimed that the final solution can be made 10 to 20 times as strong as the original serum. The amount of foreign protein in it is also said to be much less than in the equivalent amount of ordinary serum and the so-called anaphylactic reactions of the patient are correspondingly less common. The serum has now been standardised, the unit being the amount that will protect a mouse against a million fatal doses of pneumococcal culture. The relative potency of the serum against the various types is shown by the fact that a given dose will contain on an average 2000 units against type 1, 2000 against type 2, and 200–400 units against type 3.

In the clinical test at the Bellevue Hospital the following method was adopted. As soon as the diagnosis of lobar pneumonia had been made the cases were numbered and serum was given to those with even numbers, the remainder being given exactly similar treatment in every other respect. The patients thus selected by chance then had intradermal and ophthalmic tests for supersensitiveness to horse serum, after which 80–100 c.cm. of Felton's serum was given intravenously. Dosage on the following days depended on the condition of the patient but was usually much smaller. 25 c.cm. being an average quantity given. Serum sickness was noted in 12 per cent. of patients and seemed to depend chiefly on the amount injected. Dr. Cecil

[1] New England Jour. of Med., Aug. 30th, p. 415.

explained the mode of action of the serum by saying that it contains agglutinins, precipitins, and opsonins, which increase phagocytosis and help to establish a balance of immune bodies in the blood, thus discouraging the circulation of bacteria. In the ordinary untreated case, he believes, immune bodies and pneumococci do not occur in the blood together; it is only at the crisis, when the organisms disappear, that the immune bodies manifest themselves. He considers that Felton's serum in pneumonia of types 1 and 2 causes an immediate and progressive rise in the amount of immune body circulating, with a corresponding sterilisation of the blood. The treatment was given in 414 cases with a control series of 407, and the results were as follows: Of the treated cases, the numbers attributed to the four types (1–4) were respectively 144, 107, 32, and 131, with a percentage mortality of 18, 39, 37, and 30. For the untreated cases the figures were 132, 95, 52, and 128, with a mortality of 32, 52, 27, and 40 per cent. In the case of type 1 infection in which serum was given during the first three days of the disease, the mortality was only 11 per cent.

These figures suggest that Felton's serum is of most value in type 1 infections, of less value in type 2, and of no value in type 3. The fact that in this last group the mortality was 10 per cent. higher in the treated cases than in the untreated, shows the need for caution in drawing conclusions from the apparent improvement in the other groups, but Dr. Cecil is evidently satisfied that the serum is useful, for he says that in it "we have a potent product, a polyvalent product; we have a stable product, we have a practical product, something that is easy to administer and which does not give severe reactions. We hope to have within the next year a polyvalent type 4 serum which we can use in type 4 pneumonia and thus have a specific agent for three out of the four forms of lobar pneumonia." In the subsequent discussion Dr. F. T. Lord pointed out that there was good reason to believe that the mortality of type 1 pneumonia could be reduced if antiserum was given in the first three days of the disease. Nearly everyone agreed that it was unjustifiable to treat every pneumonia patient with unrefined type 1 pneumococci as soon as his condition was clinically diagnosed, for this meant that two-thirds of them would be liable to troublesome reactions without any possibility of benefit. Felton's antibody, however, was more potent, was polyvalent, and was less likely to cause reactions. A dose of 5–10 c.cm. intravenously obviated the necessity of complicated apparatus, and its administration before the type of pneumococcal infection was determined saved at least 24–48 hours—a precious interval in pneumonia. It was useful not only in type 1 but probably also in type 2 pneumonia, and he believed that with due precautions there need be no hesitation in giving it to patients who were not hypersensitive to horse serum.

MALARIA IN CANTONMENTS.

THE Malaria Commission of the League of Nations, whose findings we summarised on Sept. 29th (p. 664), has pointed out that antimalarial methods are many and their applicability so various that an immense amount depends on the selection of a shrewd superintending officer. This view finds warm support in an article on The Cantonment Malaria Problem, by Major T. O. Thompson, in the September number of the *Journal* of the Royal Army Medical Corps. He points out that it is not much good destroying anopheles in the cantonment while a privately owned neglected bit of land on the boundary is left to harbour myriads, that reclamation need not always be very expensive, and that quite well-educated people may escape antimalaria instruction and be surprised to find that mosquitoes are breeding round their own bungalows. He notes that it is difficult for the "antimalaria officer" to trace out in detail the life-history of the various local species of mosquito if he is constantly being deplaced to relieve a sick brother officer in a neighbouring station or to accompany a unit for a couple of weeks on a march; he also observes that it is harder to enforce the proper use of mosquito nets in units whose medical officers themselves notoriously neglect the precautions ordered. His greatest hope is in the mosquito proofing of buildings, although methods highly commended in one place are not always just as successful when tried elsewhere. He recommends that a spot-map be made of all the beds in a unit with the malaria cases marked as they occur, so that local mosquito-breeding may perhaps become conspicuous, and he advises that particular attention be paid to the man on detached or special duty, who is apt to get into mischief for want of official supervision.

THE MEDICAL BASIS OF RITUAL.

SCIENTIFIC administrators have often tried too conscientiously to impose by force upon a people of Eastern or primitive mind a rational law of hygiene. It is of the utmost importance for public health that the tenets to be observed should be expressed "in the vulgar tongue" and based on the natural ways of thought of the people concerned. Western hygienists are apt to think that sanitary science is a product of modern pathology, whereas, in fact, it is universal. Dr. A. N. Chatterjee illustrates this truth in an article[1] showing that the religious enactments of ancient India contain as effective a sanitary code as the book of Leviticus. The priest or prohit was the medical officer of health, and his success in controlling epidemic disease, in disposing of sewage, and ensuring a pure water-supply was surprising. According to the instructions excreta were always to be passed into a hole six inches deep and covered with grass and earth; houses were to be swept daily and special ceremonies called for elaborate periodical "spring-cleaning" of every nook and cranny. Decaying vegetable matter was believed to breed insects and had to be cleared out of dwellings and burnt. A set of rules for every man included daily bathing in pure water and care of the teeth and bowels. Since all food had to be offered to the gods before it was eaten, and since unclean and infected food could not be offered up, the purity of the people's food was assured. In the same way the water-supply was deified and any pollution of the rivers became grave sin. A dead body was regarded as infectious, and the bodies of those who died of dysentery, consumption, small-pox, and other similar diseases required special purification before cremation. This involved burning to ashes all the clothing and bedding with which the patient had been in contact and imposing a quarantine period on the bearers—i.e., usually the relatives who had nursed the patient. House disinfection was enjoined after any illness; pots, pans, and garments were washed with ash, earth, and water, and blankets with powdered soap-nut and white mustard; cooking vessels were boiled and floors scraped; cotton fabrics were washed and hung in the sunshine. Dr. Chatterjee says that for the most part diseases were ascribed to living creatures, mostly invisible. Some liked meat and others preferred sugar; some lived in vacant and dirty houses and others on the earth. They grew in large numbers in dirty unplastered dwellings, in exposed excreta, on public roads, on battlefields, and in places of pilgrimage. When people did not observe the laws of hygiene and sanitation these animals attacked them. But for the trifling difference that these were called "pishaches" instead of bacteria there is little contrast between the old and the new. When an epidemic threatened, the wise men introduced a particular form of worship to meet the case. For a people who understand ritual better than logic it is far more effective to declare that a patient has become the dwelling-place of a goddess and must therefore be respectfully isolated, than to impose the routine of a European fever hospital for no reason that the relatives and friends can understand. The Sitala

[1] Patna Journal of Medicine, 1928, iii., 167.

Puja, or ritual of the goddess of small-pox, excluded visitors, prohibited the sale of milk, forbade members of the family to attend public functions, and ordained a fire of resin, camphor, and sandalwood at the door of the patient's room. Vaccination of contacts would be a small and inconsiderable addition if introduced as part of the religious obligation.

GOITRE IN NEW ZEALAND.

SIMPLE goitre is well known to be prevalent in New Zealand, and toxic goitre occurs sufficiently often to present a difficult problem. During the past few years we have had occasion to notice several articles on the ætiology and prevention of goitre emanating from the medical school of the University of Otago; five of these have now been collected in a "Goitre Number" of the *Proceedings* of this Medical School,[1] under the editorship of Prof. D. W. Carmalt-Jones. Most of the work done has been concerned with simple goitre. There are at least half a dozen theories current purporting to account for the occurrence of endemic goitre: fæcal contamination of water, radio-activity of water, salts dissolved in drinking water, general diet, geological formation, and iodine deficiency in diet. The last of these, and in a special sense the geological formation, appear to be the essential causes of the endemic goitre in New Zealand. This is well brought out in an exhaustive survey by Prof. C. E. Hercus, Prof. W. N. Benson, and Mr. C. L. Carter, who, as bacteriologist, geologist, and chemist respectively, studied goitre in the whole country. The percentage of goitre among school-children was taken as a basis, and these authors divided the Dominion into 33 districts, each as far as possible homogeneous in its geological and physiographical circumstances. The average amount of iodine in the soil and the average incidence of goitre among school-children within each district were then ascertained, standard methods of soil-analysis and diagnosis of goitre being applied. Roughly the incidence of the disease was found to be inversely proportional to the amount of iodine in the soil and an actual formula of the relationship could be defined: "percentage of incidence of goitre among school-children is equal to 6 plus the quotient of 360 divided by the amount of iodine in ten million parts of soil, so long as this does not exceed 50." The conclusion reached is that "though there are certain points unexplained, the whole body of facts is too large, and the relationship too consistent, to be fortuitous."

This work on the ætiology of the disease is separated from a discussion on prophylactic measures by an informative paper by C. E. Hercus and K. C. Roberts on the iodine content of certain foodstuffs. Here some important results are recorded. It is shown that soil-iodine is accurately reflected in food-iodine, that there is a definite difference in the daily iodine intake in the food-supply of typical goitrous and non-goitrous districts, that commercial salt is an unreliable source of iodine-supply, and that the iodine content of human milk in the goitrous woman is lower than in the non-goitrous. These facts having been established, prevention still remains fraught with difficulties. According to Prof. Hercus the greatest of these is the danger which attends the indiscriminate use of iodine in a community containing a large number of people with potentially toxic goitres. The problem is to supply the iodine deficiency in a universal, simple, and harmless manner. This could be done by increasing the use of foods rich in iodine or, since the initial deficiency lies in the soil, by using iodine-rich manures. In practice, however, there are objections to both these methods, and the two measures in vogue consist in giving iodine in medicinal form to school-children and in adding iodine to some article of diet in universal use throughout the country. Extensive medicinal treatment of school-children has given highly satisfactory results in New Zealand with no untoward effects, but this method of prophylaxis is too limited in scope to be acceptable as a national scheme. The preparation of iodised salt has therefore come to be regarded as the method of choice. In 1924 the Department of Health introduced into the Food and Drugs Act a definition which stipulates that iodised salt must contain one part of potassium iodide in 250,000 parts of salt. The use of this salt, however, is as yet largely confined to the table, and Prof. Hercus is in favour of the compulsory iodising of all cooking and table salt introduced into the country. The minimum amount for the functional requirements of the thyroid gland appears to be 0·005 mg. of iodine per day, and this quantity is considered to be far too small to be a factor in the production of hyperthyroidism. The amount of salt consumed either in cooked foods or directly as a condiment varies so greatly with individual or skilled taste that it may be found difficult in practice to ensure that each person gets enough and not too much extra iodine. But in a country where about one child out of every three has a goitre, it is probably worth giving this convenient form of universal administration a prolonged trial.

[1] No. 5. 1928. Published by Budget, Ltd., Dunedin, N.Z.

PRESERVATIVES IN FOOD.

THE use of boric acid in food was the subject of an address delivered before the Edinburgh Rotary Club a few days ago by Dr. Andrew Rutherford, lecturer in pathology at the Edinburgh Medical School. The public mind had, he said, been made anxious by accounts in the press of illness arising from alleged food poisoning, coupled with the suggestion made by a distinguished chemist that the prohibition of boric acid as a food preservative had brought a definite risk to the community "because it limits the period during which food can be kept free from contamination." But, said Dr. Rutherford, attacks of food poisoning had not been more frequent of late than in former years; actually fewer outbreaks had occurred this year than previously, and none at all in Scotland—they had merely received more press publicity. The causes of food poisoning had been known for many years; they were specific disease-producing germs which become implanted in food, stale or fresh. The illnesses they brought about were neither new nor mysterious to pathologists or to the medical advisers of the Government. They had nothing whatsoever to do with the presence or absence of weak chemicals like boric acid as preservatives in food; no chemist, however distinguished, could competently express an opinion on the broad question of food preservatives in relation to disease. That was the domain of physicians, pathologists, and public health experts. Ptomaine poisoning in man, Dr. Rutherford reminded his hearers, was in fact exceedingly rare; the vast majority of cases of food poisoning were due to living specific microbes which in various ways might become implanted on food or drink. Small quantities of boric acid would neither prevent the access of those germs nor kill them if they were present. Food such as sausages and pork pies, containing preservatives, had often been associated with acute gastro-enteritis. A preservative might keep food looking fresh and smelling fresh when dangerous microbes were growing in it. Certainly boric acid would keep it, in the popular phrase, "free from taint," but in doing so might mask a far greater danger than mere taint. Generally speaking, food was handled in this country with far too little regard to the possibilities of contamination, and much stricter cleanliness than obtained at present was desirable in the handling, storage, and cooking of food. The recent regulations dealing with preservatives tended to lessen and not to increase food poisoning outbreaks. The Meat Inspection Regulations and the Milk and Dairies Acts—irksome as they might be at times to traders—served a similar purpose. Wherever food was kept or cooked the utmost efforts should be made to prevent the access of flies, mice, or rats. Milk should be pasteurised and cold storage provided. Employees who handled or cooked food in large concerns like bakeries, hotels, restaurants, and clubs, should be proved not to be carriers of the typhoid or food-poisoning germs before

they were taken on. It was, concluded Dr. Rutherford, almost monstrous to insinuate, as had been done widely in some sections of the press, that the Ministry of Health had done wrong in putting a stop to the doctoring of food by chemicals.

THE HARVEY FILM.

THE film, showing the series of experiments carried out by Harvey in formulating his proof of the circulation of the blood, which was prepared by Dr. H. H. Dale and Sir Thomas Lewis for the Royal College of Physicians of London and was exhibited at the Harvey tercentenary celebration last May, will be shown by permission of the Royal Society of Medicine in their Barnes Hall, on Tuesday, Oct. 30th, at 5 P.M. In compliance with the injunction of the Home Office that the film should be shown only to scientific audiences, admission will be limited to medical practitioners and students of medicine, who may obtain tickets, bearing their own names and not transferable, by calling personally either in the Issue Room of the Library of the Royal Society of Medicine (1, Wimpole-street, W.), or in the Office of the Royal College of Physicians in Pall Mall East. As the seating accommodation is limited early application is advised.

FROM SPA TO SPA.

MEDICAL delegates from many countries reached London early in the week for this year's meeting of the International Society of Medical Hydrology, and the proceedings opened auspiciously on Tuesday night with a reception at the Royal Society of Medicine, attended by more than 200 guests. Six years have passed since the Society's foundation, and in this time much has been done to draw together workers all over the world who are especially interested in treatment by physical methods and natural waters. The number of patients, both here and abroad, who seek relief at spas shows the importance of this branch of medicine, and the Society's journal, the *Archives of Medical Hydrology*, has consistently encouraged a scientific outlook and a more frank exchange of views among those who practise the specialty. Of late the claims of chronic rheumatism have received a large share of public attention, and the Society has played no small part in arousing this active interest. It was natural, therefore, that the President, Lord Dawson, in his opening speech on Tuesday, should dwell on the facilities for treating rheumatism at the spas, at the same time emphasising the necessity for establishing clinics for teaching the disease in the large industrial centres beside the homes of those who cannot leave their work. At their meeting on Wednesday morning the members considered the allied question of the relation of the spas to the State and to National Health Insurance, and the subject of rheumatism again appears on the agenda for the meetings to be held at Harrogate and Buxton over the week-end. The Society has formerly held its annual conferences abroad, and so large a gathering of foreign spa physicians at the British health resorts is certainly unprecedented. This makes it the more desirable that the promise of the programme shall be fulfilled and that this meeting shall be a source of pleasure and profit to all concerned.

MERCURIC IODIDE AS A GERMICIDE.

A SOLUTION of mercuric iodide in watery potassium iodide has been widely used as a disinfectant, as it lacks the corrosive action on instruments and tissues that "perchloride" unfortunately exerts. But Dr. H. Candy and Prof. W. Bulloch have now found that the faith placed in this method of disinfection is unjustified.[1] Steam-washed catgut ribbons were immersed in a 1/1000 solution of mercuric iodide for 1710 days and were still infected at the end of that time. Silk threads retained bacterial spores after 666 days at room temperature in a 1 per cent. solution in ethylic alcohol. Chemical experiments to ascertain the part played by mercuric iodide in tissue showed pretty conclusively that the molecular unity remains unimpaired, and has an unsuspected stability. The search for the ideal disinfectant continues unabated; meanwhile it seems that biniodide of mercury must follow several other hopeful competitors to the scrap-heap.

[1] Brit. Jour. Exper. Path., 1928, ix., 179.

WELSH NATIONAL MEDICAL SCHOOL.

THE dispute between the authorities of this School and the Cardiff Royal Infirmary, where the students have hitherto done their clinical work, appears to be reaching a climax. Public opinion in South Wales is crystallising on the side of the authorities of the medical school, whose efforts to provide adequate instruction for students in their final years have been nullified by the refusal of certain members of the staff to coöperate. Lord Aberdare, who has been the treasurer of the hospital for several years and a most generous subscriber to its funds, has resigned this post, giving the following reason: "The recent decision of the Council not to coöperate with the medical school is so contrary to all I expected of them that I feel bound to take this step." He has refused to reconsider his resignation and has suggested that the matter in dispute should be referred to Sir John Eldon Bankes. At a meeting of the Cardiff City Council held on Oct. 8th Alderman H. M. Thompson asked the chairman of the Finance Committee when the committee were going to recommend to the City Council the withdrawal of the £2000 subscription granted to the Cardiff Royal Infirmary, in view of the action of the executive body of that institution in arbitrarily withdrawing facilities necessary for the medical education of Welsh students. It seems probable that the embarrassments of this unfortunate school may shortly be relieved.

AT the opening meeting of the Medical Society of London it was announced by the hon. treasurer that the famous John Ward Diary had been sold for £10,000. Of this sum £9000, he said, had been invested, the remaining £1000 going to the improvement of the Library.

THE fourteenth annual conference of the National Association for the Prevention of Tuberculosis will be held on Monday and Tuesday next, Oct. 15th and 16th, in the Great Hall of the B.M.A. House, Tavistock-square, London. Sir Arthur Stanley, as Chairman of the Council, will formally open the conference at 10 A.M. on Monday, when Dr. R. C. Ferguson, of Saskatchewan, will introduce the subject of the occurrence of tuberculosis among primitive peoples. He will be followed by Colonel J. J. Vassal, M.D., ex-director of health of French Equatorial Africa, and by Prof. S. Lyle Cummins, principal medical officer of the Welsh National Memorial Association. On Tuesday Sir Robert Philip will introduce the second subject, being the principles underlying a scheme of anti-tuberculosis measures in any country. He will be followed by Dr. Howard Holbrook, of Hamilton, Canada, and Dr. G. Lissant Cox, central tuberculosis officer for Lancashire. The discussion will be continued on the afternoon of each day.

WEST KENT MEDICO-CHIRURGICAL SOCIETY.—On Nov. 9th Dr. J. A. Ryle will address this society on Some Symptoms and Consequences of Arterial Disease, and on Dec. 14th Sir G. Lenthal Cheatle will give the Purvis Oration, entitled Certain Matters Concerning Tumours. Fixtures for next year are a clinical evening (Jan. 11th) and addresses by Mr. H. P. Winsbury White on Chronic Infection of the Urinary Tract (Feb. 8th), by Dr. James Neal on Some of the Medico-legal Difficulties of General Practice (March 8th), and by Dr. J. R. Wylie on Diagnostic Problems within the Chest and Abdomen where X Rays may be of Use (April 12th). The President's address will be given on May 10th.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

VII.—THE INTERPRETATION OF REPORTS ON THE CEREBRO-SPINAL FLUID.

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II. The Pathologist's Results.*

A complete report on a normal specimen of cerebro-spinal fluid is shown in the second column of the table. Such a report would exclude certain acute diseases, such as general paralysis, meningeal syphilis, and all forms of meningitis. It would not, however, exclude tabes, in which the fluid is normal in 10 to 15 per cent. of all cases, nor cerebral vascular disease, whether due to syphilis or atheroma. Nor would it exclude cerebral tumour, although it would almost certainly exclude spinal tumour. It would still admit of such diagnoses as disseminated sclerosis, encephalitis lethargica, or even poliomyelitis, although some abnormality, such as excess of cells, is usually encountered in these diseases. In certain forms of paraplegia—as, for example, subacute combined degeneration, amyotrophic lateral sclerosis, and syringomyelia—the cerebro-spinal fluid is usually completely normal. Many progressive nervous diseases may thus still be present in spite of a "normal" report, and unless this is realised the physician may often be disappointed by the lack of help which the examination gives.

Wassermann, Sigma, Meinicke, and Kahn Tests.

Considering this report in more detail we may take first the most specific of the tests, the Wassermann reaction. We are accustomed to accept a positive Wassermann reaction as proof positive of syphilis, and this assumption has much justification; but there are one or two possible sources of error. The most frequent of these are false positives given by certain cerebro-spinal fluids which contain an excess of protein and which tend to coagulate during the test. To guard against this possibility, it is wise to inactivate the fluid by heating it at 56° C. for 20 minutes, as is done with blood serum. This does not, in my experience, weaken a true positive reaction, and it is absolutely necessary if the strength of the reaction in the cerebro-spinal fluid is to be compared with that in the blood. In my opinion, a positive reaction given by an unheated cerebro-spinal fluid is very untrustworthy. This point is of the great importance since, especially in tabes dorsalis, a positive Wassermann reaction may be the only abnormality in the fluid, and this may be associated with a negative blood Wassermann. In a series of 530 cases of tabes examined at the National Hospital, Queen-square, during the past nine years, I have found the cerebro-spinal fluid normal except for a positive Wassermann reaction 33 times. In 28 of these the blood Wassermann was also positive, in the other 5 negative. A negative Wassermann reaction in the cerebro-spinal fluid is of more doubtful meaning. It is well known that in about 20 per cent. of all cases of tabes, and in about half of the cases of syphilitic hemiplegia, the fluid Wassermann is negative. It is rare to find in tabes a negative Wassermann in association with an increase of cells and protein, but this sometimes occurs in cases in which the blood Wassermann is negative. On the other hand, the fluid Wassermann may be strongly positive when the blood Wassermann is negative. This combination is fairly common in tabes, and not unknown in general paralysis; but it practically never occurs except in these two diseases.

The *effect of treatment* on the Wassermann reaction of the cerebro-spinal fluid is very different in general paralysis (G.P.I.) and tabes, from what it is in secondary and tertiary meningeal syphilis. For whereas in the latter conditions a course of treatment of ordinary intensity for a period of two or three months usually suffices to render the fluid completely negative (however little it may affect the blood Wassermann) it has little if any effect on the reaction of the fluid in tabes and G.P.I. It may reduce the cell count, though rarely to normal figures, but the globulin, Lange, and Wassermann reactions remain practically untouched. So constant is this immobility of the fluid changes in G.P.I. that it forms one of the most valuable criteria in the differential diagnosis between this disease and cerebral syphilis of the meningo-vascular type. Malarial treatment, even when most successful in producing clinical improvement, does little to alter this law. Gradually, if improvement is maintained, the changes in the fluid recede, but for many months after the patient has returned to work, the Wassermann reaction in his cerebro-spinal fluid remains positive. Usually this reaction recedes pari passu with the Wassermann reaction in the blood or if anything more slowly, so that at one period the fluid Wassermann reaction may be positive and the blood Wassermann reaction negative. In tabes also the Wassermann reaction usually recedes as slowly in the fluid as in the blood, but both are less resistant to treatment than they are in G.P.I. In purely meningo-vascular syphilis, on the other hand, the Wassermann reaction in the fluid always disappears long before that in the blood, and in the meningitis of the secondary period treatment often banishes the Wassermann reaction in the fluid with the greatest rapidity.

Of the other reactions for the diagnosis of syphilis which depend on a precipitin or agglutination reaction similar to that in the Widal reaction, the most generally used are the Sigma, the Kahn, and the Meinicke. It is too early yet to be dogmatic as to their value when applied to the cerebro-spinal fluid. Even the Kahn reaction, in which the reacting substance in the cerebro-spinal fluid is concentrated ten times for the test, appears to be less sensitive than the Wassermann reaction. It must be remembered that in the Wassermann reaction ten times as much cerebro-spinal fluid is used as blood serum, and, therefore, a result which is reported as of equivalent strength in blood and cerebro-spinal fluid (say + ± in each), is only one-tenth as strong in cerebro-spinal fluid as in blood. In the precipitin tests, as in the Widal reaction, the dilution of the reacting substance is of more importance than the total quantity present. Consequently unless the cerebro-spinal fluid is concentrated by some such method as that used by Kahn, the results given will be much too weak.

Colloidal Reactions.

As regards the less specific colloidal reactions (gold, benzoin, paraffin, or mastic) we are on less certain ground. Of these reactions the Lange's colloidal gold is among the most used. While normal fluid causes no alteration in a colloidal gold solution, precipitation of the gold may occur with cerebro-spinal fluid from cases of (1) G.P.I., (2) syphilis of the central nervous system, (3) meningitis. It is convenient for the differential diagnosis of these conditions that the precipitation occurs in different dilutions, though these overlap to some extent. The dilutions of fluid used in the test are usually 10 in number, varying from 1/10 to 1/5120. The result of the test in each of the 10 test-tubes is usually stated in figures from 0 to 5, 0 denoting no precipitation, and 5 denoting complete precipitation, intermediate changes shown by alterations in the colour of the gold-sol from red to blue being indicated by the figures 1–4. Therefore a report of 0011100000, which would be the reading of a normal C.S.F., indicates that there was no precipitation in most of the dilutions, but a very slight one in the dilutions 1/40, 1/80, and 1/160.

G.P.I.—The result of the colloidal gold test in typical cases of G.P.I. is said to be *the paretic response.*

* Part I.—The Practitioner's Results—appeared last week.

Precipitation occurs in the eight strongest dilutions, diminishing gradually. A typical response expressed in the general form would be 5555443200.

Cerebro-spinal syphilis and tabes.—The precipitation here occurs in higher dilutions, a typical *luetic* response being 0014320000.

Meningitis.—The so-called *meningitic response* is less reliable as a guide to diagnosis. The precipitation first occurs at the dilution of 1 in 160 or thereabouts, and is at its maximum at the dilution of 1 in 640. A typical response would be 0000244330.

It is probably true that a strong reaction is obtained in every case of general paralysis, and in every case of acute and progressive meningeal syphilis. But negative or weak reactions do not negative the diagnosis of tabes or of meningo-vascular syphilis of less acute form. On the other hand, strong reactions of the "paretic" or "luetic" type, when associated with a negative Wassermann reaction, must be taken as evidence against rather than for the diagnosis of syphilis. This last statement must be modified for cases which have undergone antisyphilitic treatment, as in them the colloidal reactions may remain positive after the Wassermann reaction has disappeared. Of the diseases in which a positive colloidal reaction is found with a negative Wassermann reaction, *disseminated sclerosis* is much the most common. In an early case of this disease, especially during the more acute exacerbations, it is usual to find the colloidal reactions positive, and even strong "paretic" types of reaction may be encountered. *Encephalitis lethargica* also occasionally causes a strong colloidal reaction, but in a much smaller proportion of cases. Sometimes, however, a weakly positive colloidal reaction may be the only abnormality in the fluid in cases of post-encephalitic Parkinsonism or other sequelæ of this disease. In *Mongolian idiocy* also the colloidal reactions are often positive with an otherwise normal fluid.

Table showing the Typical Changes in the Cerebro-spinal Fluid in Various Diseases.

—	Normal.	Meningitis. Meningococcal.	Meningitis. "Influenzal."	Meningitis. T.B.	Disseminated sclerosis.	G.P.I.	Tabes.	Meningeal syphilis.
C.S.F.	Clear; colourless, no coagulum.	Ginger-beer turbidity; coagulum.	Clear; fine coagulum.	Colourless, with cobweb coagulum.	Clear; colourless.	Colourless; sometimes fine coagulum.	Clear; colourless.	Clear or turbid; sometimes fine coagulum.
Cells— Polymorphs	0 } Cells	200 to 2000	10 to 50	0 to 100	0	0 to 5	0	10 to 50
Lymphocytes	0·3 } per c.mm.	5 to 50	100 to 400	100 to 300	5 to 100	5 to 100	5 to 100	50 to 300
Total protein* .	20 to 35	50 to 200	30 to 100	50 to 200	30 to 60 rarely higher.	40 to 100	30 to 60	50 to 200
Globulin— Nonne-Apelt.	0	± to +	Weak +	± to +	− to +	− to ++	± to +	± to +
Pándy ..	− or faint haze	+ to ++	+	+ to ++	− to −	− to −+	± to +	− to ++
Glucose* ..	50 to 75	0 to 15	15 to 55	15 to 50	Normal.	45 to 60,	45 to 70	Normal.
Chlorides* ..	720 to 750	650 to 680	690 to 730	580 to 650	"	Normal.	Normal.	"
Urea*	10 to 40	Normal.	Normal.	Normal.	"	10 to 60	10 to 60	"
Langes— (Colloidal gold)	Negative, or at most 00111000000	Variable.	Usually negative.	0000123320	5544321000 or 123210000 or negative.	5554432110 or 444321000	0014320000 or 1354321000	5543210000 or 1354321000
Other colloidal reactions.	No change.	"	"	Variable.	Similar changes.	Similar changes.	Similar changes.	Similar changes, often fairly intense.
W.R.	−	−	−	−	−	+	+ in 80%, − in 20%	+
Kahn and Sigma	−	−	−	−	−	+	Usually +	+
Culture	No growth.	Meningococci.	No growth.	No growth. T.B. in films.	No growth.	No growth.	No growth.	No growth.

* mg. per 100 c.cm.

Cell Count.

Although the cell count is the most important part of the examination of the cerebro-spinal fluid, it is the least specific, as many forms of disease of the central nervous system are associated with an increased number of cells. It is useful to distinguish three types of reaction according to the differential cell count:—

1. The "polymorphonuclear type" when more than 75 per cent. of the cells are polymorphonuclear.
2. The "lymphocyte type" when over 90 per cent. are mononuclears.
3. The "mixed type" in which polymorphonuclears form rom 15 to 70 per cent. of the whole.

The usual number of cells found in various diseases is shown in the table. To some extent each disease has its characteristic type of reaction. Coccal meningitis causes a polymorphonuclear reaction. Tuberculous meningitis and poliomyelitis either the lymphocytic or mixed type, and syphilis the lymphocytic type. Disseminated sclerosis and encephalitis lethargica (in most epidemics of this disease) cause a pure lymphocytic reaction. But here also we meet with anomalous cases. Cerebral tumours usually cause no excess of cells, but occasionally a fairly intense reaction of the mixed type or even of the polymorphonuclear type is encountered. The latter finding would suggest cerebral abscess, but may occur when a glioma is undergoing degeneration. As a general rule, however, the presence of a high polymorphonuclear cell count indicates microbic infection of the meninges or nervous system. In cases of otitis media or inflammation of the accessory nasal sinuses, the presence of polymorphonuclear cells in the fluid, even if no organisms can be found in it, is a sign that the inflammation is approaching or has reached the brain. Such a fluid is often found when inflammation has spread to the dura mater, and the term "meningitis sympathica" has been given to such cases. The fluid may be almost clear, but is often turbid or even almost creamy in appearance. It may be distinguished from the fluid of generalised septic meningitis by the absence of organisms in films and in culture. It should, however, be regarded as a danger signal which calls for careful watch by the surgeon. Similar fluids may be found after blows on the forehead which have fractured the cribriform plate of the ethmoid. In such cases a channel is often left whereby organisms reach the meninges whenever the patient catches a cold, and each attack of nasal catarrh may be associated with the clinical signs of meningitis and a purulent aseptic cerebro-spinal fluid; until finally a more virulent organism, such as the pneumococcus or streptococcus, may gain access to the subarachnoid space and cause a generalised and fatal meningitis.

When the cell excess is of the "lymphocytic" or "mixed" type, and clinical signs of meningitis are present, the diagnosis often lies between tuberculous meningitis and poliomyelitis or between tuberculous and "influenzal" meningitis. By the latter term I wish to indicate cases in which clinical signs of meningitis come on in the course of an attack of influenza, and not only the cases in which Pfeiffer's "influenza bacillus" is found in the fluid.

are much more serious than the former, although after infancy only about 50 per cent. are fatal. Meningitis in the course of influenza, on the other hand, usually disappears very rapidly after lumbar puncture; but the appearance of the fluid resembles that in tuberculous meningitis so closely that a needlessly unfavourable prognosis may be given. In this form of meningitis and in poliomyelitis the normal percentage of chlorides and of glucose distinguish the fluid from that of tuberculous meningitis, in which both these substances are reduced, the chlorides usually to a level between 600 and 650 mg. per 100 c.cm.

Meningeal syphilis, especially that which occurs during the secondary stage, may be associated with a very great excess of cells, either of the mononuclear type or of a mixed type in which polymorphonuclears form up to 50 per cent. of the total. The fluid may appear turbid and give a cobweb coagulum on standing. There is, however, little reduction of glucose or chlorides and the presence of a positive Wassermann reaction settles the diagnosis. If, however, no suspicion of syphilis arises, and the Wassermann reaction is not performed, the appearance of the fluid may easily lead to a wrong diagnosis.

Occasionally considerable excess of cells may be found in association with a normal percentage of protein. This syndrome, to which the name *cell protein dissociation* has been given, is confined to a few diseases, of which disseminated sclerosis, encephalitis lethargica, and poliomyelitis are the most common; even in these diseases it is the exception rather than the rule. In the other inflammatory diseases of the nervous system, excess of cells is always associated with excess of protein, although the relative increase in these two elements varies greatly; large numbers of cells may be associated with only slight increase of protein, and highly albuminous fluids may contain comparatively few cells.

Protein Excess.

The protein of normal cerebro-spinal fluid consists chiefly of albumin with a smaller proportion of globulin, and when the protein is increased this relationship holds good; there is, therefore, always much more albumin than globulin except in the solitary instance of general paralysis in which the globulin may equal the albumin. It is, therefore, inexact to speak of globulin excess as though that were the only protein fraction which mattered, for something may be learnt from a rise in the total protein even when no excess of globulin can be found. It is true that a slight excess of protein by itself does not give so definite an indication of disease as when it is associated with a positive Nonne-Apelt reaction (see below), but any excess above 50 mg. must be considered pathological, and this may be the only definite abnormality present. A total protein of 50 to 60 mg. is associated, in general paralysis, with a fairly strong Nonne-Apelt reaction, and in tabes dorsalis with a rather weaker reaction. When the protein rises above this level it is always accompanied by positive globulin reactions, and the balance between protein and globulin is not quite so easily estimated. It appears, however, that a fair index of this balance is afforded by the colloidal reactions; in fact, whatever of specificity these reactions possess, appears to be due to the balance between albumin and globulin.

Globulin Tests.

Of these the Nonne-Apelt is certainly the most satisfactory, as in it even the slightest haze is pathological. It consists in the addition of cerebro-spinal fluid to an equal quantity of a saturated solution of ammonium sulphate. Cloudiness or opalescence is a sign of a positive result. The Pándy reaction is of value also, as it shows at once where protein excess is absent. In this test a drop of cerebro-spinal fluid is added to a c.cm. of saturated phenol solution; when it produces no immediate haze or opalescence it is possible to say that protein and globulin are within normal limits. The test, however, may give weak positive results with normal fluids.

Just as the syndrome of cell increase with normal protein is only found in a few diseases, so also the opposite syndrome of considerable protein excess with normal cells has its special diagnostic significance. This combination was called by Nonne the "compression syndrome," as it is commonly found in compression of the cord. It may also occur in cases of cerebral tumour, although in this disease it is the exception rather than the rule. It may, however, be found in polyneuritis, and in cases of localised meningitis, such as may occur around a focus of myelitis, and it may be present a few weeks after an attack of poliomyelitis. Therefore, even in paraplegic cases, it does not necessarily indicate compression of the cord, and its value in this respect is very much less than that of manometric readings and the Queckenstedt sign. Similarly, in cerebral diseases we rely more on the manometer than on the alterations in the fluid to tell us whether we are dealing with cerebral tumour or with thrombosis of cerebral vessels.

Two examples in which some of these points occurred may help to emphasise them.

CASE 1.—A man between 30 and 40, a cocktail habitué, suffered from neuritis, with extreme tenderness of his legs. He had also deteriorated mentally, his memory was poor, and he was facile in manner, rather pleased than otherwise that his paralysis was due to toping. In view of his habits cerebral syphilis could not be excluded. Lumbar puncture gave a clear fluid with only 15 cells in 10 c.mm. It contained three times the normal amount of protein (100 mg. per 100 c.cm.), but only gave a very weakly positive Nonne-Apelt and a weak positive Pándy reaction. The Wassermann and colloidal gold reactions were completely negative. The fluid, therefore, only gave indications of polyneuritis, and cerebral syphilis could be excluded.

CASE 2.—A man of 36 had suffered for three years from weakness and numbness in the left leg. This had improved after the first few months so that he could play tennis, but it had recently returned, and with it similar symptoms had appeared in the right leg and arm, so that writing was now difficult. Lumbar puncture gave a clear colourless fluid containing 26 lymphocytes per c.mm., with 60 mg. of protein, and giving definitely positive globulin reactions (Nonne-Apelt +, Pándy ++). The colloidal gold reaction gave a weak "paretic" curve 4442211100. The Wassermann reaction was negative in cerebro-spinal fluid and blood. The diagnosis of disseminated sclerosis, which was confirmed by this report, was subsequently proved at autopsy.

These examples show that the strength of the globulin reactions may bear very little relationship to the quantity of total protein present.

Glucose; Chlorides; Urea.

To some extent the amount of these substances in the cerebro-spinal fluid varies with that in the blood. In the case of *urea*, as has already been said, the percentage in the two fluids is always *identical*. The *chlorides* in the cerebro-spinal fluid are always higher than in the blood, and the *glucose* always lower. For the *chlorides* the relationship is fairly constant at 1 to 1·25, even in cases where the cerebro-spinal fluid chlorides are reduced. In fact, recent work has shown that the reduction of fluid chlorides which occurs in meningitis is chiefly due to their reduction in the blood. None the less this reduction is of definite diagnostic value. As regards *glucose* in the spinal fluid the normal relationship of from 45 to 65 per cent. of the blood-sugar remains fairly constant except in meningitis; in this disease the glycolytic ferments set free by dead cells or bacteria break up the glucose as quickly as it reaches the cerebro-spinal fluid from the blood. Consequently it is always low and continues to be destroyed after the fluid has been drawn off. In the early stages of tuberculous meningitis, however, glucose may be present in almost normal amount. In aseptic, purulent fluids the amount of glucose varies greatly. Sometimes it is absent, in other cases abundant. This seems to depend on the number of polymorphonuclear cells which have been killed by bacterial toxins. Excess of mononuclear cells seems to have little effect in reducing the glucose in the fluid, at any rate if the examination is made immediately the fluid is drawn off, but in tuberculous meningitis some reduction of glucose is always found, whatever the type of cell present.

Special Articles.

MENTAL DISORDER AND DEFICIENCY IN 1927.

THE SHORTAGE OF ACCOMMODATION.

THE Board of Control, in their Report for 1927,[1] lay stress on several problems of increasing urgency. Everyone in any way connected with lunacy administration will share their great regret that no legislation has yet been introduced to give effect to the recommendations of the Royal Commission of 1926. The passage of the Mental Deficiency Act, 1927, was, however, an event of far-reaching importance. Not only have various difficulties been removed which were inherent in the Act of 1913, but the new Act defines mental defect and, by the changes which it introduces into the definition of the four categories of defectives, enables provision to be made for post-encephalitic and other similar cases.

The shortage of accommodation for mentally diseased patients and mental defectives alike is increasingly serious, but whereas the large majority of the counties and county boroughs have either provided a mental hospital of their own or possess a share in one, not a single local authority has itself provided sufficient institutional accommodation to meet the needs of its own defectives, and scarcely 18 per cent. have provided any accommodation whatever. Of all persons annually sent for treatment under the Lunacy Acts, 93·5 per cent. are received into county or county borough mental hospitals, but upon the lowest calculation the number of defectives who require institutional care and cannot have it is not far short of 20,000. The Board, however, oppose strongly the suggestion, at first sight reasonable, to concentrate for the time upon the provision of accommodation for defectives and to relax efforts to accommodate mental patients. "No such policy ought to be countenanced for a moment," they say, "nor ought any rivalry to be admitted between the two components of this dual need." The two problems are complementary, and one cannot be considered without the other. The Board regret that advantage has not been more often taken of Section 28 of the Mental Deficiency Act of 1913, which permits one committee to be constituted for the purposes of both Acts. The ruling factor, of course, as they point out, is public opinion. The community now fully realises that provision for the requirements of certified patients is an absolutely unquestionable duty. What it has yet to realise is that a large number of these patients would never have become certifiable if they had had proper treatment at an early stage, and that a large proportion of the poor-law expenditure and of the cost of the prison service is traceable to neglect in caring for mental defectives.

The Mental Hospitals.

On the first day of 1928 the number of notified insane persons under care in England and Wales was 138,293, an increase over the figure for 1926 of 1667. The number of direct admissions was 21,893, 31 less than in the previous year. The ratio of admissions per 10,000 of the populations aged 16 and over is now 7·66, and the table given in the Report shows a steady decline in the last seven years. The general recovery-rate is 31·43 per cent. of direct admissions, and the general death-rate is 7·94 per cent. of the average daily number registered, against 7·30 per cent. for 1926; this is the first rise in the death-rate since 1922. The number of patients resident in county and borough mental hospitals increases on an average by 2529 every year. The number of vacancies, on the other hand, in spite of the reopening of Ewell Colony, Epsom, has decreased from 2319 in 1926 to 1570 at the beginning of this year. Moreover, whereas on Jan. 1st, 1927, there were vacancies for 148 women, there was in January of this year a deficiency of recognised bed space for 34. The position, in the words of the Board, has become critical. As a temporary measure Ewell Colony, originally a hospital for male epileptics, was reopened last year as a mental hospital with beds for 100 men and 320 women, and it is estimated that by the end of this year various small additions and rearrangements will have provided accommodation for another 1250 patients—barely half the average annual increase. "It is evident that such makeshifts will do very little to ease the general situation, and unless energetic measures are promptly taken serious overcrowding of these hospitals is inevitable." At the moment only two authorities, Middlesex and Swansea-Merthyr Tydfil, are building new institutions. The situation is complicated by the fact that 15 local authorities, responsible for nearly 2500 patients, have no mental hospital of their own but contract with neighbours to receive their patients. Now that very few mental hospitals have any vacancies, the larger of the authorities with no institution of their own are finding it extremely difficult to secure accommodation. As a rule they have not sufficient patients to make the erection of a hospital economical, and the solution suggested by the Board is that they should arrange with neighbouring authorities who own institutions to extend them sufficiently to accommodate their patients for a number of years.

Mental Deficiency.

Serious as is the shortage of accommodation for "lunatics," the position of the constantly growing army of defectives who require institutional treatment is much more so, and the Board report that, unless a great effort is made in the immediate future, it will become difficult and even impossible to administer the most important sections of the Mental Deficiency Act. Urgent cases needing prompt action frequently come to the notice of the Board, and no vacancies can be found. On the first day of 1928 the number of defectives in institutions was 20,429; at the most moderate estimate—1 per 1000 of the whole population—the number requiring treatment is 39,067. During the last six years the number of defectives of whom local authorities have obtained knowledge has increased from 25,470 to 61,522; many of these are reported to local authorities because they have got into trouble of some kind and need protection in institutions. The figures for the last few years of defectives recommended by education authorities show a progressive increase, which will become more rapid as education authorities awaken to the necessity of further care for defectives leaving school. Although most of these authorities have not completed their ascertainment and some have hardly begun it, the January returns show that 1479 cases are "awaiting removal to an institution." Moreover, on Jan. 1st there were 265 defectives in "places of safety," that is, detained. This measure was clearly intended merely to ensure the safe custody of a defective during the fortnight or three weeks before a petition is presented, and detention for considerable periods without training or proper classification is obviously very unsatisfactory. Of equal importance, in the Board's opinion, is the great and increasing difficulty in finding accommodation for cases reported from prisons, who otherwise have to remain where they are under admittedly undesirable conditions. The Board do not mention, but certainly do not overlook, the deplorable handicap that rests upon the infant but highly beneficial enterprise of those benches of magistrates who employ trained psychologists to help them to keep defectives out of prison. Finally, the lack of accommodation in proper institutions results in the certification of a very large number of mental defectives under the Lunacy Acts, especially of low-grade and troublesome patients, for whom managers of small institutions and boards of guardians are naturally unwilling to shoulder the

[1] Fourteenth Annual Report of the Board of Control. Part I. H.M. Stationery Office. Pp. 87. 1s. 9d.

responsibility. Mental hospitals would be short enough of beds even if they were not obliged to shelter defectives, whom they cannot benefit and who hinder the recovery of other patients. The Board consider the need to be so urgent that they devote much space in their Report to an eloquent restatement of the numerous irrefutable arguments in favour of an immediate and adequate effort by all local authorities to found sufficient colonies to house all the defectives who in the interest of the community should be cared for in special institutions. The present shortage is, in their opinion, not entirely due to difficult financial conditions, but is sometimes the result of a failure by the local authority to realise the importance and gravity of the situation. Mental defectives are very prolific and always beget defectives; defective parents inevitably create centres of degeneracy, disease, inebriety, pauperism, and crime, for which local authorities cannot escape responsibility. The greater number of defectives who are given training early in life can be rendered harmless and amenable, cured of obnoxious habits, and under favourable conditions and proper supervision made self-supporting. The duty of all whose words carry weight with those responsible is obvious: to press and to continue pressing for the full and adequate recognition of the vital importance of this problem to the nation's health.

The New Mental Deficiency Act.

The most important alteration of the law governing defectives is made by the section which replaces Section 1 of the old Act; instead of limiting mental defect to conditions dating "from birth or from an early age," it defines it as "a condition of arrested or incomplete development of mind existing before the age of 18 years, whether arising from inherent causes or induced by disease or injury." The new Act thus includes defect resulting from encephalitis lethargica, epilepsy, and other diseases. The Board do not summarise the Act in detail, but point out certain other important amendments. The class of patients "subject to be dealt with" now includes any patient of whom his parent or guardian has represented to the local authority that he needs care or training that cannot be provided in his home. The parent's consent may now be dispensed with when he is abroad and the attempt to obtain it would mean undue delay. When a court has ordered a certificate and it has been found impracticable to present one, or the court has dismissed it and the case is left unsettled, the temporary detention may be extended. The local authority is charged with providing suitable training or occupation for defectives under supervision or guardianship or in certified institutions, and authorities which exercise dual powers under the Mental Deficiency and Education Acts may provide ordinary certified schools which can be at the same time certified institutions for defectives.

The Board reprint much of what they wrote last year on the marriage of defectives, and state that in the light of fresh experience and resolutions they have received from a number of local authorities, their opinion is that the time has come when definite legislative steps should be taken to prevent the marriage of those under Order. They have not, however, seen any reason to modify their attitude towards sterilisation, which they do not think promises any substantial help towards solving the problem of accommodation. They comment again on the wide variation in the returns sent in by the various local authorities of defectives ascertained during the year. The figures vary between 4·66 and 0·03 per 1000 of the population, a discrepancy greater than can be accounted for by any possible difference of local incidence. The Board state that the methods of local authorities returning low figures call for improvement, and recommend the employment of a specially trained officer or the use of the services of a specially trained secretary of a voluntary association.

The number of defectives under guardianship has increased by 252, but 49 authorities have not a single case under guardianship, and 29 others have only one or, at the most, two. The Board reiterate their warning of last year urging care in the selection both of guardians and of cases for guardianship; in this field their experience has been closely parallel with that of the Scottish Board.[2] The search for suitable guardians should, they say, be organised and not left until urgency arises. A list may be submitted by the ascertainment and supervision officer, or a guardianship society can be formed; some such plan should be set on foot in every district, to prevent the sending of defectives far from their own counties and their own local authority. The northern counties have so far no organisation of this kind.

Mental Nursing and Other Matters.

The Board commend the progress made in providing detached nurses' homes, which not only set free very necessary accommodation but tend to raise the status of mental nurses and the standard of their work. They promise a fuller discussion of the subject in a future report. Meanwhile, they notice with great pleasure the opening in June, 1927, of the new nurses' home and training school at the County Mental Hospital, Maidstone. By far the largest of its kind, this home accommodates 136 sisters and nurses; it is separate from the hospital, cost £46,000, and set free space for 160 beds.

The commemoration of the Pinel Centenary called for a historical article on mechanical restraint at the end of Part I. of the Report, and the work of the voluntary associations is warmly commended. There is a note on the mental after-effects of encephalitis lethargica. Part II. of the Report contains, in addition to statistical tables, entries by commissions at institutions and other matter, a supplement setting out or mentioning 65 contributions submitted to the Board on clinical and pathological research and routine laboratory work carried out in institutions visited by them. Five of the papers deal with biochemical problems, five with encephalitis lethargica (including two dealing with its treatment by malaria), ten with general paralysis, and four with treatment in general. Only two deal with histology, a subject which the Board consider does not nowadays receive sufficient attention. The Board commend the work highly, exhort every medical officer to contribute his share to it, and encourage the record of negative equally with positive findings.

THE LONDON MEDICAL EXHIBITION.

(*Continued from p. 729.*)

BOOTS PURE DRUG CO., LTD. (Nottingham), displayed photographs of their analytical, research, and manufacturing laboratories as a background to a representative selection of their standard products, among them being Stabilarsan, Sulphostab, Thiostab, Bismostab, and Vaccines (St. Thomas's). In addition there was an interesting display of the synthetic antiseptic Acriflavine, and prominence was given to a series of pharmaceutical products of this non-irritant bactericide; pessaries, gauzes, solution tablets, bougies, an emulsion as a surgical dressing, and an oral tablet as a urinary antiseptic. Capsules and tablets of Hexyl-Resorcinol were also on exhibit and a solution in glycerin with "low surface tension advantages" when used as a surgical dressing. Liver Extract "Boots" (M.R.C. approved process) in various forms was exhibited and also Cholumbrin for cholecystography, and Viules, a series of sterile ampoules products. Insulin and Ephedrine were also shown.—E. H. SPICER AND CO., LTD. (Watford, Herts, and 72, Wigmore-street, London, W.). One of the prominent exhibits on this stand was Calsoma, the tribasic phosphates of calcium and magnesium, sodium biphosphate, and magnesium citrate in effervescent form. This has proved a useful gastric antacid,

[2] THE LANCET, August 18th, p. 339.

relieving the distressing symptoms of gastric and duodenal ulcer. Another exhibit was Solvochin. This preparation is a 25 per cent. solution of quinine in stable form for injecting large doses of quinine intramuscularly without local irritation. Bacillus Acidophilus Emulsion was also shown and a complete line of "Homburg" specialties. THE HOYOXVOX LA ROCHE CHEMICAL WORKS, LTD. (51, Bower-road, London, N.19), presented "Thyroxine" for use in obesity, myxœdema, troubles of growth and development, cachexia, and obesity; and Isocen, a tasteless, odourless, nontoxic aperient as well as Sensafane, a liquid hypnotic, and Sedobral, a tablet which masks the taste of the contained bromide in the bromide in which the tablet is intended to make.

COATES AND COOPER (41, Great Tower-street, London, E.C.), among a large number of pharmaceutical preparations, showed "Salvos," which is claimed to be preferable to colloidal preparations of lithium, and "Pyridol" Pyrol, a stainless iodine for oral use and injection. The firm are the agents for the American Apothecaries Co., N.Y., the Temmler Chemical Works, Berlin; and Reed and Carnrick, Jersey City, N.Y.; the latter firm showed, among other preparations, Pepsozyme, containing the enzymes which enter into the process of digestion; Protonuclein, mixed glands for correcting proteiciencies of the internal secretory system; and Nephritin, obtained from the cortex and convoluted tubules of young fresh kidneys. Tetrasol and Ovacoids were also exhibited. Coates and Cooper also represent THE HARRIS CHEMICAL FOOD CO. (Montreal, U.S.A.), who showed "Lava," a laxative food; "Paramels," mineral oil in caramel form; and "Food Perrin," a new iron food. PARKE, DAVIS AND BYESF, LTD. (31, Southampton-street, London, W.C.) made a display of glandular products, drawing particular attention to OVARIAN HORMONE (Folin), standardised to 10 mouse units per ampoule, and an extensive range of glandular tablets. Many pharmaceutical products were also shown.

DIXOL LABORATORIES, LTD. (10, Leicester-fields, London, W.C.), had an exhibit of their product which is prepared in the form of pulverised, syrup, pastilles, lavage powder, ointment, insufflation powder, dentifrice, and dusting powder. A bactericide 25 times more efficient than phenol, it is not absolutely free from voided with the faeces. ICHTHYOL CO., LTD. (18, Adam-street, Adelphi, London, W.C.). Ichthyol, the product of this company, is made from the raw material obtained from the exclusively owned quarries at Seefeld, in the Tyrol, and is therefore genuine. The preparation called forth many inquiries. "Ichthargan," "Ichthoform," and "Ichtholan" (10, 20, and 50 per cent. salve), Albichthon (colourless), and Bristow's medicated "Ichthyol" toilet preparations were also shown. THE MOND STALLOTHERM REFINING CO., LTD. (17, Victoria-street, London, S.W.), exhibited samples of Mond product together with literature explaining the use of the preparation.

SCHERING, LIMITED (3, Lloyd's-avenue, London, E.C.), in addition to a number of useful medicinal products, showed Veramon, an analgesic; Medinal, a rapidly acting hypnotic and sedative; and Neutralon.—CHAS. ZIMMERMANN AND CO. (CHEMICAL), LTD. (9-10, St. Mary-at-Hill, E.C.). The display by this firm included Posterisan, a local vaccine from *B. coli communis* in the form of ointment and suppositories for the treatment of haemorrhoids and allied conditions; Asthmolysin (Weiss), a standardised suprarenal pituitary compound; and Idozan (5 per cent. Fe), a neutral, easily assimilable form of iron as ferric hydroxide in a labile colloidal suspension. Kathiolan, the Danish treatment for scabies, was also shown.—PARKE, DAVIS AND CO. (50-51, Beak-street, London, W.), among a fine selection of biological and pharmaceutical products, showed Metatone, a tonic elixir containing vitamin B and nucleic acid in combination with glycerophosphates; Oxytocin and Vasopressin, two active principles of the posterior lobe of the pituitary body; as well as Paroidin, a standard extract of bovine parathyroid glands, for use by injection. BENGUE AND MARTIN COMPANY (112, Cheapside, London, E.C.), in addition to Sal Hepatica, a well-known and useful effervescent saline laxative, showed Zirtol, an antiseptic of the naphthol-cresol series of phenols, for use in dental disorders, in gynæcology, and in post-operative surgery, and also Ipsora Tooth Paste, which, with Cleanoral and Pebeco, Dentol, Oxygen, a coagulant for the oral cavity and Lenderoxide, spray, and bleeding gums. Here it was convenient to mention KOLESSO INCORPORATED (Cleveland-street, London, W.C.), who exhibited their Kolesso Dental Cream, which is free from grit and is a valuable adjunct for pathological conditions of the mouth. As the foam of the preparation can be used as a mouth wash, while a Dentine Powder is a non-irritant preparation for cleaning artificial teeth and dental plates. THE ANODYNE CHEMICAL CO., LTD. (80, Cockspur-street, London, S.W.). At this stall was displayed the Freeborn gas-burners with lampshades which bear the name of the firm. The lampshade with the burner is purchased by a special process and it forms a perfect combination, the oil globule being very minutely and evenly subdivided. HARMOTTO, LTD. (7 and 8, Milverton-street, London, S.E.), showed a fine selection of Tablets—Gravel, Compound, a standard medicine for the treatment of furunculosis, and allied complaints, and of Lab. Calcium, calcium salts, hypophosphite, 5 per cents. in sterilised milk. The claims as to the efficacy of this compound in wasting conditions are supported by experiments made on rats and rats.

THE ANODYNE DRUG CO., LTD. (55A, Gray's Inn-road, London, W.C.), showed, in addition to the well-known Stanomel, Mercloline, Oranyol, and Ano-dine, a stabilised Acetylsalicylic-Hydrochloride, a powerful extract of the Anodyne, for the treatment of Rheumatism, Gout and Lumbago; Tinitrine Cutanea (Dalsi), a preparation of trinitrin in quite a new pharmaceutical form, as a soft coated sugar-coated pills, for medication in cases of angina pectoris; "Pulmonol" an emulsion of the trinitrin long-acting, producing an immediate hypotensive action; and also Iodo-pine and Sulphotone, two intestinal bactericides which appear to be efficacious in all chronic and acute infections. MOTTS PHARMACEUTICAL, LTD. (7, Chiltern-street, London, W.C.), had a display of the original Subcutaneous Arsenobenzene Salvarsan in a comprehensive range of dose varying from 0·3 to 0·9 g., which, apart from its value in syphilis, appears to have a field of application in puerperal infections; Tetrasol-Ciba, an efficacious organic combination of iron, arsenic, glycerophosphate, and strychnine, for hypodermic injection; Bismon, a new bismuthic product, Bismuth Camphorate in ethylated olive oil, for the treatment of syphilis; and Cedrex capsule of pure essential oil of *Cedrus atlantica*, for the treatment of gonorrhœa and cystitis. THE SACCHARIN CORPORATION, LTD. (72, Oxford-street, London, W.), drew attention to Cantron, a preparation specially put up for the use of dentists as a nerve devitalizer, and exhibited Novocain in powder, tablets, and sterilised solution in ampoules and bottles. Trivalin in solution and capsules, a morphia substitute of quick action which, it is stated, leaves no bad effects, was also made prominent. WHITLEY AND SONS, LTD. (Aldersgate Chemical Works, Carnwarth-road, Fulham, S.W.), showed a new therapeutic agent, Staniform, combining tin and a methyl radicle of iodine. Its antiphlogistic, analgesic, and antiseptic properties seem to be well substantiated by clinical evidence. It is made in the form of an ointment and a dusting powder. Another new compound of tin shown by this firm is Lactate of Tin Methyl.—BENGUE AND CO., LTD. (24, Fitzroy-street, London, W.), showed the Dr. Bengué's Balsam, which is a combination of menthol, methyl salicylate in lanoline basis, Pulmo (Bailly), an organic combination of calcium, phosphorus, and guaiacol; and Lipiodol (Lafy), which is pure iodine (10 per cent.) in oily suspension, for intramuscular injection.—PROMONTA CO., LTD. (127, Regent-street, London, W.). Amongst the exhibits shown by this firm were

New-Promonta, an organic food preparation containing the lipoids of the central nervous system and the vitamins A, B, and D, combined with lime, iron, hæmoglobin, soluble lacto-albumins, and carbohydrates; and Hepatopson, a highly concentrated liver extract, for both of which reports and clinical statements were supplied to visitors.—GENATOSAN, LTD. (Loughborough, near Leicester). Sanatogen, Genasprin, Formamint, detoxicated and ordinary vaccines, together with calf vaccine lymph were exhibited at this stall, particular attention being drawn to Anticoryza Spray for prophylactic and curative purposes, and to an Anti-diphtheria, Scarlet Fever, and Whooping-cough Spray, for producing local immunity during epidemics.—INHALING DRUG AND APPARATUS CO., LTD. (30, Grosvenor-place, S.W.), demonstrated their Spiess-Drager drug nebulising and inhaling apparatus, which is simple to operate and can be purchased or hired.—THE PINEOLEUM CO. INCORP. (agents: Brooks and Warburton, Ltd., 40–42, Lexington-street, London) showed their standardised preparation of Pineoleum for medication of the nose and throat.

SURGICAL INSTRUMENTS.

ALLEN AND HANBURYS LTD. (Bethnal Green, London, E.), whose exhibit covered several stands, specialise in drugs as well as surgical instruments, and it should be mentioned that the drug section made a special feature of the presence of vitamin D in their Food for Infants, Malted Rusks, Allenburys Diet, and in Bynotone. A Liver Extract and a Tubercle Vaccine were also made prominent, as well as the Lister Institute therapeutic sera and vaccines.—A wide selection of surgical instruments in stainless steel was shown, attention being called to œsophagoscopy and bronchoscopy instruments, to new syringes and apparatus for hæmorrhoidal injections, and to the Universal Duralumin splint for Colles' fracture. Another interesting exhibit was the Bartholomew's Hospital pattern improved operation table. Prominence was also given to a new detachable blade knife, the method of attachment being simple and easy.—MAYER AND PHELPS (Chiron House, 59–61, New Cavendish-street, London, W.) attracted attention by a large selection of surgical instruments and hospital furniture, including forceps for introducing radium capsules and needles, and apparatus for the treatment of the larynx and œsophagus, as well as appliances for blood transfusion and a lip spoon for feeding infants in cases of prematurity and hare-lip. Another feature of the exhibit was the M.P. Clinical Lamp, which has been designed for use in the hospital ward and for general examinations by the private practitioner. Where there is no available electric current the lamp is adapted for use with an "Ever Ready" torch.—DOWN BROS., LTD. (21 and 23, St. Thomas's-street, London, S.E.). The representative collection of surgical appliances by this firm, some of which have been recently introduced, included a new set of bone operation instruments for which pneumatic power is used as a driving force. This was a constant source of interest. Many of the surgical instruments are made in stainless steel. Dressing tables and operating tables, including the "Up-to-Date," with recent improvements, were also shown.—THE SURGICAL MANUFACTURING CO., LTD. (83 and 85, Mortimer-street, London, W.), who particularly called attention to the "Barton" Sphygmomanometer, had a large exhibit of surgical instruments and appliances, sterilisers, operating tables, consulting-room couches and tables, weighing machines, improved instrument cabinets, and splints.—THE HOLBORN SURGICAL INSTRUMENT CO., LTD. (26, Thavies Inn, London, E.C.), presented a good selection of surgical instruments, both in ordinary and stainless steel, including the Minop Knife, which enables different blades to be used with one handle. The Holborn pedestal operation table was also shown.—J. T. LEACH (representative of CAMERON'S SURGICAL SPECIALTY CO., 15, Stratford-place, London, W.) made a feature of a combination of electrically lighted instruments for orificial examination, transillumination, treatment, and surgery. All the instruments are constructed to permit of sterilisation.—SHORT AND MASON, LTD. (Aneroid Works, Macdonald-road, Walthamstow, E., and 45–49, Holborn Viaduct, London, E.C.), made a display of "Tycos" clinical thermometers and the "Tycos" micro-barograph, and urinary glassware.—KODAK, LTD. (Kingsway, London, W.C.), had a most attractive display of clinical photography taken on panchromatic films, the detail of skin surface being particularly fine, while the exhibition of "medical motion pictures" by the Cine-Kodak Camera and projector was a continued source of interest to visitors.—HAWKSLEY AND SONS, LTD. (83, Wigmore-street, London, W.), presented an excellent selection of stethoscopes, ophthalmoscopes, microscopes, blood diagnostic instruments, sphygmomanometers, and physiological and anthropometrical instruments of various kinds, as well as an outfit for the injection of insulin.—BRUCE GREEN AND CO., LTD. (14, 16, and 18, Bloomsbury-street, W.C.), drew special attention among their display of optical apparatus to special combination sets for the examination of the eye, ear, nose, and throat, to the Turnville-Stewart ophthalmoscope, to the hand slit-lamp and retinoscope, and to the slit-lamp attachment for ordinary ophthalmoscopes.—DOMEN BELTS CO., LTD. (456, Strand, London, W.C.), made a feature of pregnancy, accouchement and general support, hypogastric, and gastroptosis belts, as well as belts for hernia and floating kidney. Corsets, back supports, and bandaging of various kinds were also displayed.—THE SCHOLL MFG. CO., LTD. (Granville-square, London, W.C.), exhibited arch supports and many ingenious appliances for the relief and correction of foot troubles.—ORAVOX, LTD. (26, Langham-street, London, W.), showed a wide selection of hearing aids.

LIGHT AND HEAT APPARATUS.

STANLEY COX, LTD. (39, Gerrard-street, London, W.), drew attention to a diathermy apparatus—the Intertherme—the special feature of which is the spark-gap which does not require adjustment, and to a large selection of mercury-vapour lamps, tungsten arc lamps, and various electro-medical appliances. The "Trilite" ultra-violet ray apparatus shown by this firm combines three lamps in one, and by its use many different methods of application may be made.—MESSRS. JOHN BELL AND CROYDEN (Savory and Moore, Ltd.) (50–52, Wigmore-street, London, W.) showed a complete set of infra-red lamps which produce no visible radiation, in addition to the new model quadruple arc which permits nine distinct treatments to be given by one lamp, and a new model general purposes mercury-vapour lamp.—ALLEN AND HANBURYS, LTD. (48, Wigmore-street, W.), exhibited Hanovia quartz lamps in large variety and specially directed attention to the electro-radiant "Thermega" Blanket and Rug, which not only acts as a substitute for the hot-water bottle, but airs, dries, and warms, gradually and evenly, right through the bed.—PHILIPS LAMPS, LTD. (145, Charing Cross-road, London, W.C.), made a feature of a new self-contained X ray unit, the "Metalix-Portable," making it possible for every medical practitioner to use radiography successfully. It can be operated from any convenient light socket. A full range of "Metalix" X ray tubes was also shown, including a new deep therapy tube for a current of 220,000 volts.—THE MEDICAL SUPPLY ASSOCIATION, LTD. (167–185, Gray's Inn-road, London, W.C.), who in another exhibit showed a fine selection of surgical instruments and hospital furniture, called attention to their X ray, electrical-medical apparatus, and ultra-violet light apparatus.—ELECTRICAL EQUIPMENT AND CARBON CO., LTD. (107, New Oxford-street, W.C.), exhibited various brands of therapeutic carbons and Siemens' Silit Material, which is a specially prepared medium for producing red and infra-red rays.

THE SUN RAY GLASS CO., LTD. (22, Northumberland-avenue, W.C.), had an attractive exhibit of the ultra-violet window and horticultural glass, the advantages

different parts of the country have agreed to enter into agreement with the insurance committees which are recommended to consult with the panel committee as to the types of prescriptions common to the area and to submit its views to the analyst so that he may in turn select a prescription suitable for his purpose. Every effort is to be made to secure that the name of the chemist is not disclosed to the analyst.

National Insurance and the Board of Health.

The Association expresses its regret of the passing of the board system, which had many advantages. It will, it feels, be singularly unfortunate if national insurance is to be directed by civil servants who have hitherto been completely out of touch with this department of administration, and must from the very nature of things be out of touch with those responsible for local administration. The change over implies the regretted retirement of Sir James Leishman, who has been the dominating figure in national insurance in Scotland, from the passage of the Act. His great ability, strong character, and driving force were utilised to the full in bringing the scheme into being, and his departure creates a blank which it will not be easy to fill. The Association records its high appreciation of the great service he has rendered.

Lax Certification.

The sharp rise in sickness claims during 1926 was attributed to the industrial disturbance which occurred for the major portion of that year. It was believed that the return to normal industrial conditions would bring the sickness claims back to the pre-strike figures, but, while there has been a certain fall in sickness benefits, disablement benefit has continued to rise, and the claims for cash benefits for 1927 are as heavy as for the previous year. The Association finds it difficult to avoid the conclusion that lax certification has substantially increased in recent years, but various factors are operating. The difficulty of securing employment, the increasing demand for public support, the hardship on men over middle life getting back into employment—all these tend towards increased demands on the fund; in the main lax certification consists in the granting of certificates where there is partial incapacity. The reduced contributions from the Exchequer are making the position serious, and there are many societies whose solvency is endangered by the increased claims.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Dublin Hospitals.

IN an address last week to the Companions of St. Patrick, Sir Thomas Myles said that all the advantages of a modern hospital were within the reach of the poor to-day; were we going to deny these advantages to the overburdened ratepayer who supported a wife and family and was quite incapable of meeting the expenses an elaborate examination that diseases such as cancer involved? A man whose income varied from £400 to £600 a year was surely as much entitled to the scientific advantages of those charitable institutions as were the poor. There was a great deal to be said for and against a State subsidy, but he believed that the spirit of the general public was against Government control. He did not think that Government control was either economical or efficient.

Discussing the question of amalgamating some of the Dublin hospitals Sir Thomas pointed out as an objection that such a scheme would place a monopoly in the hands of a group of men. The City of Leeds was about twice the size of Dublin; yet he did not suppose that there were in that city more than four or five men capable of carrying out all classes of operative work; whereas in Dublin there were 20 to 24 men highly skilled in all classes of surgery.

Within the past week Mr. W. S. Collis, a lay governor of the Meath Hospital, has written to the daily press advocating a scheme of amalgamation of five of the smaller general hospitals. He believes that a sum of £400,000 would be enough to build and equip a hospital of 600 or 700 beds, and that the pooled incomes of the several hospitals would support it. As it is out of the question to raise such a sum in Ireland, he advocates an appeal to the Rockefeller Foundation. He quotes from a letter from Dr. G. E. Vincent, President of the Rockefeller Foundation, in which he says:—

"Without expressing any preference or making any promises [we] will await with sympathy and interest the development of an Irish plan for improving medical education. We should naturally expect to begin negotiations on the presentation of a plan and programme which had been marked out by an officially recognised committee on which all the essential interests were represented."

Mr. Collis goes on to suggest that a committee be formed consisting of representatives of the two Universities, the five hospitals which desire amalgamation, and the two large hospitals owned by religious orders, and that this committee should draw up a scheme which might then be presented to the Rockefeller Foundation by the two Universities or by the Government at their request.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Longevity of Athletes.

THE long-disputed question whether athletics shorten life has been put to an actuarial test through the coöperation of the President's Committee of Fifty, the Carnegie Foundation, and other interested organisations. Data were obtained from ten Eastern colleges and universities, Harvard, Yale, and Cornell furnishing between them more than half the records. With the age at death known for nearly 5000 athletes who graduated in 1905 or earlier it was possible to construct a number of life tables and so to compare the longevity of these men by groups with the longevity of insured populations, according to standard life tables for the same period. The graduates of the nineteenth century showed a mortality of 94 per cent. of that expected, whereas the graduates of 1900–05 show a mortality of only 72·6 per cent. of the expected. Dr. Louis Dublin, who is responsible for the actuarial work, is inclined to think that "athletic activities in the earlier periods of loose supervision did considerable damage." It is true, of course, that even for these early days the expected mortality is slightly greater than the actual mortality, but college athletes belong to a class in which mortality should normally be well below the average of insured risks. This was demonstrated some years ago by Greenway and Hiscock at Yale, who found that although the mortality of "letter" men was less than that of the standard insurance population, it was 10 per cent. higher than that of the non-athletic Yale population. The numbers used in this latter investigation were admittedly small, but the method of controlling the mortality of college athletes by that of their classmates has such obvious advantages that further data are now being collected from the ten colleges mentioned above, to provide a control to the life tables of athletes now published by Dr. Dublin.

The cause of death was ascertained for 566 of the 1202 deaths that had occurred, and the most significant finding was the large proportion of deaths from heart disease in the age-groups over 45, no less than 32 per cent. of deaths over 45 being so attributed. Dr. Dublin points out that in an insured population it is rare to find more than 20 per cent. of deaths over 45 due to heart disease.

A Dental Survey.

The tendency to coördination of health activities, which has resulted in health councils, community chests, interlocking directorates, and so forth, has found expression in the city of Cincinnati as a Mouth Hygiene Council. A survey conducted by this body has disclosed that the city has a proportion of one dentist per 1107 population, as compared with one to 1882 for the United States. All the general hospitals are equipped for oral surgery and dental extractions. All patients entering the children's hospital are given routine dental examinations. Pre-school children are served by the dental clinic of the Babies' Milk Fund Association, while the Dental Service Society, working with the Board of Education, undertakes to look after the children in the public schools.

"Denicotinised" Tobacco.

The Connecticut Agricultural Experiment Station has undertaken the analysis of some of the processed tobaccos which claim to be "denicotined" or "denicotinised," and has also analysed a number of well-known brands of cigarettes by way of comparison. The average nicotine content of normal tobaccos was found to be 1·77 per cent, whilst the average figure for the "denicotinised" tobaccos was 1·28, or about 28 per cent. less. One firm which sells tobacco products that can be smoked "to your heart's content and with content to your heart" issues a copy of an analysis made by a New York firm of chemists who find that over 90 per cent. of the nicotine has been removed, leaving 0·1951 (sic) per cent. The same cigarettes are found by the Connecticut investigators to contain 1·02 per cent. of nicotine. And this is better than some other denicotinised cigarettes which actually contain over 2 per cent.

Homicide.

The last annual report of Dr. Frederick L. Hoffmann to the Prudential Insurance Company on homicide in the United States has aroused editorial comment throughout the country. Dr. Hoffmann shows that our murder death-rate has doubled since the beginning of this century, and for the last three years it has stood at about 10 per 100,000 population. The highest rate, 69·3, is that for Memphis Tennessee, New York, with its large foreign population, has a rate (6·1) well below the average, while Chicago, in spite of its criminal reputation, is thirty-sixth on the list with a rate of 13·3. The figure that has proved most interesting to the headlines, however, is the ratio of our murder-rate to that of England—namely, 104 to 7. The opinion of several journalists that greater severity of punishment is needed finds no confirmation in Dr. Hoffmann's report. "I have made an extended study of the death penalty," he writes, "and have come to the conclusion that it would better serve the cause of justice if it were done away with entirely."

Jews in the United States.

According to estimates made by Dr. N. S. Linfield and published by the American Jewish Committee, the number of Jews in the United States is about 4¼ millions. Forty-two per cent. of them live in New York City, 93 per cent. live in larger cities, while more than 90 per cent. live in the northern group of States. The proportion of Jews to the entire population has increased by 10 per cent. during the past ten years; in the Northern States they form 5·25 per cent. of the population, whilst the percentages in the Western and Southern States are 1·66 and 0·65 respectively. New York City is said to contain some 1,705,000, constituting nearly 30 per cent. of the population, but it is thought that the method of computing their number—namely, by counting the children who stay away from school on the Day of Atonement—is by no means accurate, the real figure being considerably higher. The Jewish populations of other cities, computed in the same way, are: Chicago, 325,000; Philadelphia, 270,000; Boston, 90,000; Cleveland, 25,000; Detroit, 75,000; Baltimore, 68,000; Los Angeles, 75,000; Newark, 65,000; Pittsburgh, 53,000; and St. Louis, 50,000.

The Tubercle Bacillus and Connective Tissue.

At the recent Congress of the American Chemical Society held at Swampscott, Mass., Prof. R. T. Anderson, of Yale University, reported experiments undertaken at the Sterling Laboratory of that University under the direction of Prof. Treat B. Johnson. Prof. Anderson has been engaged in splitting up the chemical substances derived from the growth of the tubercle bacillus and testing their end-products—fatty acids, proteins, saccharides—by introducing them into the bodies of animals. Experiments made at the Rockefeller Institute in New York by Dr. Florence R. Sabin and Dr. Charles A. Doan appear to have shown that the fatty-acid fraction of the bacillus produces tubercles microscopically indistinguishable from those due to the presence of the bacilli themselves. It is hoped, within a short time, to state the definite results obtained from each end-product separately, but it is already evident that the fatty-acid fraction determines the growth of connective tissue. The next step in this line of research would be to ascertain what agent of practical utility will inhibit this connective tissue growth.

Cookery Courses for Medical Students.

In future the medical students of Johns Hopkins University are to be taught not only what food to prescribe but also how it should be prepared. Instruction will be given by lectures and laboratory work, the laboratory being the diet kitchen of Johns Hopkins Hospital.

Dr. Franklin H. Martin, director-general and president-elect of the American College of Surgeons, states that malaria will be the first important disease studied at the Gorgas Memorial Institute at Panama. Dr. Martin, who is also the president of the institute, says that arrangements have been made with the Republic of Panama for the use of its new medical school building as a temporary laboratory for the next few years. At the last session of the United States Congress an appropriation of $50,000 (£10,000) annually for five years was made to the institute to finance this laboratory and its personnel.

Figures issued by the New York Health Department show that the city's death-rate is highest in March, with April not far behind. May proves to be a more dangerous month than July or August when the weather is at its hottest. The suggestion is made that children, young, and middle-aged people survive the heat better than the cold. It is the old to whom the heat is a serious menace.

The Beach Chapter of the Red Cross has asked the national headquarters of the organisation to "initiate a move" to raise $12,000,000 for rehabilitation of the storm-swept area in South-East Florida. A report on the conditions sent with the appeal states that the number killed by the cyclone was more than 2300 and that there were 12,000 refugees.

The Public Health Service has renewed its campaign against rats, deploring the equanimity with which people regard their depredations. The public are either unaware of the teeming rat life and its effect upon the body politic or are quite indifferent to the dangers and the cost of feeding and providing recreation for these millions of parasitic rodents. Yet without their active coöperation the fight against the rat must largely fail.

CUMBERLAND INFIRMARY CENTENARY.—The Cumberland Infirmary at Carlisle will celebrate its centenary this year. To mark the occasion, Mr. Heywood Thompson, of Nunwick Hall, has given £1000, which will be invested and the income applied to the technical instruction of the nursing staff.

ST. MARY'S HOSPITAL POST-GRADUATE COURSE.

THIS annual week-end refresher course opened on Saturday, Oct. 6th, when Dr. REGINALD MILLER gave an address on

The "Intestinal Child."

Proof that intestinal disorder could produce illness was afforded, he said, by the deportment of the ordinary infant with some intestinal trouble, and it remained true that there was more virtue in a dose of castor oil than in the most modern psychology of the nursery. Further proof was afforded by cœliac disease, where the whole nervous system went to bits because the child was poisoned by fat. The "intestinal child" was sometimes brought to the doctor for anorexia, dirty tongue, and other digestive disorders, but more often for nervous trouble and not infrequently for the purpose of ascertaining whether he was, or was not, ill. It was peculiar how often the patient was accompanied by both parents, desiring to know why they should have such an excessively badly behaved child. The symptoms were unhealthiness and unhappiness. The complexion was muddy, the eyes ringed and baggy in the evenings, the tongue coated, the appetite poor, and the breath foul; the child had a peculiar smell and looked not so much ill as like a drug addict or a person recovering from a debauch. Every conceivable disorder of the nervous system might be found, particularly negative behaviour. Negativism was a child's way of bullying its parents. Many "nervous children" were primarily intestinal; the primarily nervous child was not nearly so common as ten years ago; the relationship between parent and child had on the whole been greatly improved in recent years. The primarily intestinal child was recognisable by four cardinal signs: a tumid abdomen, occasional or persistent passage of abnormal stools, the microscopical recognition of indigestion in the stool, and the presence of excess of indican in the urine. The large stomach was not marked by the parents; in fact the mother generally referred to the abdomen of her child as its best feature.

Five types of intestinal indigestion could be recognised: 1. In *cœliac disease* fat was prepared for absorption but was not absorbed; therefore a bulky and very fatty stool was passed. 2. *Starch indigestion* was not very common; it produced a very gassy stool. Large doses of paraffin produced an even gassier one. 3. *Lamblia infection* had been brought home from the Eastern theatres of war and accounted for 6 per cent. of cases. Often it did no harm, and in any case the child outgrew the symptoms which were those of chronic enterocolitis with mucous diarrhœa—but nothing whatever would get rid of the lamblia. 4. *Nut indigestion* was appearing in quite a large number of children, and often the source of the nut in the stools could not be traced. Apparently manufacturers were using crushed nut in the preparation of some food or sweetmeat. 5. Commonest of all was *toxic constipation*, so called to distinguish it from simple constipation, where the patient remained quite healthy in spite of costive bowels. The difference lay in the presence or absence of catarrhal colitis. The most important function of the colon was the refusal to absorb the toxic products which it contained. When it became inflamed, this impermeability was lost. The treatment was quite the reverse of that of simple constipation, for which roughage and aperients were prescribed. The diet must give a smooth residue to allow the colitis to subside; there should be no brown bread or oatmeal, few vegetables—and those mostly through a sieve—and no raw fruit except orange juice and crushed banana. Simple constipation might be turned to toxic by giving rough food and senna or mercury aperients. The aperient for toxic colitis must give a formed soft stool, and it was better for the child to be constipated than to be purged, since every purging meant temporary colitis. Paraffin was satisfactory if it acted in doses of a drachm twice daily, but large quantities must not be given. Paraffin with phenolphthalein was useful, as was phenolphthalein in chocolate tablets. Best of all were the bile-salt preparations such as taxol. If the child would allow them, large colon wash-outs, 8 or 12 in six weeks, were valuable. Soap, of course, must not be used; the best preparation was 2 per cent. saline with 1 per cent. sodium bicarbonate to the pint, or Plombières water. One and a half pints should be administered. Threadworms were a guide to the fact that a child had colitis; they would not live in a healthy colon. These large enemas were the only effective means of getting rid of them.

Among the other lectures given on Saturday was one by Dr. HOPE GOSSE on the

Prognosis of Heart Disease.

Seven factors, he said, guided the physician in giving a prognosis of *aortic incompetence*: (1) The first was response to effort in ordinary daily life, and (2) the second was the strength of heart muscle remaining. (3) An important factor was the cause of the trouble; most serious was infective endocarditis, followed, in order, by syphilis, rheumatism, and cardiosclerosis. In the rheumatic heart age was significant, as well as the length of time that had elapsed since the acute rheumatic attack. (4) Further relapses of acute rheumatism increased the gravity of the prognosis. (5) The most important physical sign was the size of the heart, and two other modifying factors were (6) the response to treatment, and (7) the ability of the patient to adjust his life to his disease and its limitations. Since *aortic stenosis* was almost always complicated by aortic regurgitation, its prognosis was that of aortic incompetence made much more grave.

The stage of the disease was important in *mitral stenosis*. The patient never died in the first three stages—viz., those of a loud first sound only, of a presystolic murmur added after exercise, and when the murmur was present without exercise. Nobody could foretell when the fourth stage, that of auricular fibrillation, would ensue. The response to effort was a guide; it was but little impaired in the first stage. On examination attention should be paid to the length of the diastolic murmur. If the sequence of sounds was a diminuendo diastolic, a crescendo presystolic and a banging first sound, then the prognosis was bad. A mid-diastolic murmur meant that acute myocarditis affecting the auriculo-ventricular node was complicating the mitral stenosis. As the myocarditis subsided the murmur gradually moved up to the first sound.

Unless a *systolic apical murmur* were harsh, loud, and accompanied by a systolic thrill, it did not indicate mitral disease and would show no right-sided preponderance on the electrocardiogram. A systolic murmur to the left of the sternum might be produced by congenital heart lesion, and to the right of the sternum by aortic stenosis, aortic aneurysm, or roughening of the aortic valve.

The prognosis was perfect in cases of *sinus arrhythmia* and *extrasystole*, except that extrasystoles in auricular fibrillation rather limited the use of digitalis and to that extent altered the prognosis. *Auricular fibrillation* was the commonest cause of congestive heart failure, and its prognosis was very variable. One patient might die in a few days or weeks and another might not know he had heart trouble at all. An important point in distinguishing the varieties was the pulse-rate when uncontrolled by digitalis. If it was 65 or 70 the patient might live a moderately active life for 20 or 30 years. If it was 170 it would need a big dose of digitalis and delicate balance to keep it at 70. If the apex beat were in the nipple line the prognosis was better than if the heart were enlarged. An early case that could be controlled by quinidine had a good outlook, and the smaller the dose the better the prognosis. The ability of the patient to modify his life was important in this condition also.

Auricular flutter was an unstable condition which soon turned to fibrillation. In true heart-block syncopal attacks were a bad sign, but otherwise the patient might live a restricted life for 10 or 20 years.

The severest form of heart disease known was *pulsus alternans* in the absence of paroxysmal tachycardia. It occurred in late middle age, more often in men, and the patient never survived two years. The heart was always hypertrophied and the symptom was dyspnœa without other signs. The larger the heart and the worse the dyspnœa the more grave the prognosis; there was fibroid degeneration of the myocardium in all cases. The presence of albumin in the urine was a bad sign.

Angina pectoris was a symptom caused by different pathological conditions, and therefore the prognosis was very variable. The six factors in prognosis were: (1) the degree of effort that brought on an attack, (2) the frequency of attacks, (3) the response to treatment and the effect of rest in relieving the pain, (4) the presence of cardiac asthma, (5) the presence of Cheyne-Stokes breathing, and (6) the presence of pulsus alternans. The last three were very bad signs.

Sudden death was never caused by a valvular condition alone, except by embolism from malignant endocarditis. The commonest cause was bundle-branch lesion myocarditis, which could only be recognised by the electrocardiogram. Other causes were angina pectoris, auricular fibrillation, heart-block with ventricular fibrillation, and pulsus alternans.

The prognosis of *Graves's disease* treated medically was bad. One quarter of the cases would die in a few months or days; one-quarter would survive with severe symptoms; one-quarter would improve after many years; and the remaining quarter would recover altogether. Of those who died, some would die of mania, but most of auricular fibrillation with acute dilatation of the heart. It was most important to call in surgical aid before fibrillation set in; three-quarters of the cases would justify it. The policy was—be bold.

Mr. R. M. HANDFIELD-JONES described certain

Recent Advances in Everyday Surgery.

Injection Treatment of Varicose Veins.—He said glucose had failed in his hands and he had seen unsatisfactory results from the use of urethane and quinine. He had therefore confined his treatment to injection of sodium salicylate in varying strengths from 20 to 40 per cent. There were no contra-indications, except that any natural thrombosis might be allowed to subside before an artificial one was induced. The substance introduced was very definitely not tolerated outside the vein wall, and therefore it was essential that the needle be wholly in the vein. Blood must enter the barrel of the syringe before the injection, a small needle must be used, and the bevel must be a steep one. The needle should be introduced with the bevel parallel with the vein wall. There was no need to empty the vein, unless it were very full and bulging. Emptying a vein might draw it away from the needle. The injection should be made in the upright position, or a tourniquet should be applied to make the vein stand out. A firm bandage should be applied afterwards. Success depended entirely on not putting the patient to bed; the busier he was the better. A convenient way to give the injection was for the physician to call at the house late in the evening, on the eve of one of the patient's most strenuous days.

Injection Treatment of Hæmorrhoids.—This treatment was often of great value but there were definite contra-indications—viz., thrombosis, prolapse, and infection. No case should be injected if there had ever been thrombosis of an internal pile, or if the pile in question had ever had a definite infection, or if it had been prolapsed for more than 12 hours at any time. The technique also was quite different from that of injecting varicose veins; the whole object in injecting piles was to keep the solution outside the vein and produce a sterile necrosis, which led later to clotting of the varicose vein in the hæmorrhoid. Almost all of the many solutions in use had carbolic acid as a basis, and many of them were oily suspensions. These were bad, because the globules of oil separated from the acid in the barrel of the syringe, and the result was apt to be an injection of pure carbolic, which was disastrous. The pharmacopœial glycerine acidi carbolici was absolutely safe and efficient. The syringe should be a long narrow one, made of thick glass, with a very narrow calibre and a triple-finger action. The needle should be "shouldered" by having only about 1 inch of ordinary hypodermic at the point and the rest thick. Perrin's speculum was the best, as it had a sloped end and a side groove through which one pile could be made to project. The speculum was introduced far beyond the pile-bearing area, and therefore if any carbolic were spilt it only leaked inside the instrument. The patient should lie in the left lateral position, and the pile must be pushed up so that the needle entered the part where the mucous membrane of the rectum was reflected on to the hæmorrhoid. Not more than 5 minims of solution should be used, and again the treatment was essentially ambulant, so that the injection was most conveniently made after dinner in the evening. If the bowels were being opened regularly there was no need for a special aperient; the risk of sepsis was very slight where such a strong antiseptic solution was used.

Infections of the Fingers and Hand.—The anatomy of the distal pulp of the finger was unique; radiating lines of fibrous tissue passed from skin to periosteum, forming 16 or more closed compartments, one of which was the starting-point in 95 per cent. of infected hands. The patient related that he was awakened by a throbbing pain in his finger between 3 and 4 o'clock in the morning. Swelling proceeded rapidly until the finger was intensely tender. A longitudinal incision was useless, as it opened only one of the compartments. The cut must be horseshoe-shaped, as for flap excision of the distal phalanx. A small strip of rubber tissue was laid in when the flap was replaced and removed after 24 hours. The resulting scar was amazingly good. In *paronychia* the pus was never superficial to the nail, but lay in the nail bed between it and the bone. The only treatment was to make two vertical incisions, one on each side, nearly as far down as the crease over the distal phalangeal joint. A flap was reflected and a pair of sharp-pointed scissors thrust down to remove the nail under the skin. When the flap was replaced only a small window of exposed nail bed was left, which slowly grew up the finger until the old nail fell off. *Shirt-stud abscess of the palm* was seldom recognised; it resulted from a prick in the web. Incision over the indurated area was useless, because there was always a further collection of pus behind the lumbricals. The web must be split right open to release this.

Lymphangitis was apt to provide one of the most terrible things ever encountered in practice. It must be distinguished from a true pus infection in the distal pulp, as an ill-advised incision into the finger might kill the patient. The finger of lymphangitis was less tender and tell-tale red lines ran up the forearm. Not much harm was done if the doctor failed to incise a pus infection, but untold damage might result from incising a lymphangitis; therefore, in a doubtful case the knife should be left alone and the treatment consist of temporising measures such as poulticing and antistreptococcal serum. A mild lymphangitis case had a history of a prick, a slightly swollen and throbbing finger, and a flaring temperature which subsided in 24 or 48 hours. The infection might localise in four or five days to a small pus abscess at the site of infection, or there might be a considerable degree of general constitutional involvement. Sometimes, however, there was a terrible fulmination, and the patient was dead almost before treatment was commenced. The only line of treatment that was of any use at all for these cases was blood transfusion.

If the temperature leaped to 105° F. and there was a rigor, then a suitable donor should be installed in the same building immediately, ready for prompt transfusion if there was no improvement in 12 hours. It was no use transfusing a moribund patient.

Ordinary *tenosynovitis* of the palm revealed itself by sudden swelling of a finger from tip to base, with marked tenderness over the tendon only. The finger was held partly flexed, and any attempt at extension was violently resented. The incision must not be central but lateral, opposite each phalanx. If there was much pus it should be made continuous down the length of the finger and extended into the palm. If the little finger were involved the incison should be on the ring-finger side; if pus welled up from below when the palm was pressed the opening must be extended along a grooved director to open the ulnar bursa in the hand. If the thenar bursa were involved, the cut should extend alongside the bulge of the thenar eminence.

Two spaces, not well known, in which pus might collect, were the thenar and the middle palmar, between the lumbricals and the interossei. Pus in the thenar space caused ballooning of the thenar eminence, and should be released from the back by an incision along the length of the shaft of the index metacarpal, forceps being then slipped over the adductor transversus pollicis. Infection of the *palmar space* did not cause much bulging because of the tenseness of the palmar fascia; the palm might become flat instead of hollow. The space was opened from the third or fourth web, following down the lumbrical. No septic hand, no matter how bad, should ever be given up.

Dr. J. A. RYLE spoke on the

Nature and Relief of Some Common Gastric Symptoms.

After pointing out that the sensitivity of the stomach lay in its muscular coat, he said that persistent, localised pain should always suggest organic disease, while its rhythm would indicate the diagnosis. Delayed pain due to increased tension in the muscular fibres of the pyloric antrum was produced by reflex impulses, typically from a duodenal ulcer. The pain was not in the ulcer and was relieved by complete emptying of the stomach, by initiating the normal mechanism of relaxation of tonus—i.e., taking more food—and by alkalis. These acted in two ways: first by producing gas, which caused eructation and relief of intravisceral pressure; and, secondly, by relaxing the sphincters and so ensuring complete and rapid emptying. Immediate pain, typically that of ulcer of the lesser curvature, was aggravated by food and relieved by vomiting and alkalis; it was presumably caused by tautening of some circular band of fibres. Pain occurred in many other conditions, notably anything causing faulty emptying or pyloric obstruction. "Hunger" pain might be produced by some sort of reflex mechanism more remote than that of duodenal ulceration—e.g., gall-stones, cholecystitis, and appendicular disease. The same rhythm of pain might occur without abdominal disease, as in heavy smokers and worried folk who bolted their meals. Presumably this depended on some perturbation of the normal motility of the stomach. Treatment depended on the cause, and included food, warmth, and alkalis. If pain were associated with anorexia, carcinoma should be carefully excluded.

Flatulence was not entirely, but very largely, a subjective symptom. Fullness, distension, and distress extended from the epigastrium to the chest and often to the left shoulder, and were accompanied by attempts at eructation. The term "flatulent dyspepsia" should not be used, as there was no evidence that fermentation could take place in the stomach in sufficient amount to produce eructation, except in cases of obstruction, when the gas brought up smelt of sulphuretted hydrogen. Malodorous flatulence meant organic disease and was an important symptom. Odourless, repeated, noisy flatulence was always due to aerophagy, of which the patient was quite unaware, and simple explanation or psychological treatment was usually successful. It might also occur rhythmically, near the time of the next meal, in organic disease, being due partly to the altered motility and partly to the patient's attempts to relieve discomfort by eructation. In women who were "fair, fat, and forty," it was apt to indicate gall-stones, especially when described as "a bursting feeling" so that the patient had to loosen her clothes. The sensation of flatulence could be produced by an excess of gas in a normal stomach or by a normal amount of gas in a hypertonic stomach.

Nausea might be physiological, as in pregnancy, or pathological, most commonly in alcoholic or septic gastritis; it also occurred in mild chronic cholecystitis, jaundice, migraine, and labyrinthine vertigos. It seemed to depend on waves of relaxation of the muscle tone. An X ray taken during an attack of migraine would show complete quiescence of gastric peristalsis; there was temporary stasis during vertigo, and oils and fatty foods—such as caused nausea—tended to inhibit the motor activity. If associated with headache an error of refraction should be sought.

Anorexia occurred in people with poor muscular tone, in gastroptosis, acute fevers, tuberculosis (especially morning anorexia), and carcinoma of the stomach. It was perhaps the most important symptom of the "leather bottle stomach," where it was most constant. Anorexia was more sustained than nausea. Treatment depended on the cause, but rest was quite as often indicated as exercise, especially in the anæmic and debilitated.

Heartburn was the least adequately explained of all gastric symptoms, and was probably due to spasm of the cardiac end of the œsophagus. It was associated with excess carbohydrate intake, lack of exercise, and enteroptosis, but very rarely with organic disease. It was relieved by bicarbonate of soda and was not a symptom of hyperacidity.

Acid eructations were generally associated with true hyperchlorhydria and were regulated by alkalis and general treatment; the term "acidity" had become confused and vague and should not be used.

Water brash was an increased reflex activity of the salivary glands, so that a quantity of clear, tasteless, non-acid fluid suddenly appeared in the mouth, sometimes preceded by pain in the parottid. If often occurred in duodenal ulceration. Stringy, "phlegmy" mucoid secretion might be regurgitated from the œsophagus, especially in alcoholic gastritis. This was the result of hypersecretion in the œsophagus from chronic irritation.

NEW MARGATE HOSPITAL.—The Lord Mayor of London, who was accompanied in state by the sheriffs, has laid the foundation-stone of the new Margate and District General Hospital, which is to cost between £50,000 and £60,000. There will be 80 beds.

CHILD GUIDANCE CLINIC IN SPITALFIELDS FOR JEWISH CHILDREN.—We recorded this time last year (THE LANCET, 1927, ii., 716) the establishment of a clinic for the study and treatment of maladjusted and delinquent children and adolescents, under the auspices of the Jewish Health Organisation of Great Britain. The clinic is located at the Jews' Free School, Spitalfields, London, E., and is available irrespective of race and creed. It is open on Mondays, Tuesdays, Wednesdays, and Thursdays, from 6.30 to 7 P.M. The staff consists of two psychiatrists, a psychologist, and a specially trained social service worker. Besides providing facilities for skilled examination and treatment, advice is given on particular problems, and the clinic is also prepared to undertake the examination and observation of young offenders and to supply reports to magistrates and teachers. As part of the treatment children may be sent into the country or temporarily placed with foster parents or in convalescent institutions. School care committees and other social agencies coöperate in furthering the aims of the clinic by referring cases, by collecting information, and by aiding in the suitable placing of cases. Students of social science who intend qualifying for mental welfare work are offered opportunities of practical training at the clinic. The material accumulating in the course of the work is at the disposal of research students.

Correspondence.

"Audi alteram partem."

CONVALESCENT MEASLES SERUM.

To the Editor of THE LANCET.

SIR,—The leading article and the paper by Dr. William Gunn in your last issue (pp. 709 and 690) draw attention to the great loss of infant life from measles, and to the value of serum obtained from convalescent cases in protecting children who have been exposed to infection. Its use, however, need not be confined to hospitals and institutions; it will prove of equal value in private households, where a delicate child is often exposed to great danger, when measles has been contracted by an elder member of the family.

This serum has been used with success in many countries, and in several towns in France, Germany, and the United States arrangements have been made to obtain supplies. Similar arrangements could be made in this country by local authorities, hospital committees, or voluntary agencies; such work, being a preventive measure, is well within the province of a public health authority. The difficulty is to obtain the serum; but it is not a difficulty which is insuperable. Convalescent adults, most of whom are treated at home, can often spare sufficient blood, without detriment to their own health, to provide enough serum to protect from 10 to 30 children, and to be asked to give some blood, which may be the means of saving a child's life, is a request which will appeal to the generous instincts of many British citizens. The family doctor is in the best position to make such a request.

It is suggested that whoever decides to arrange for the provision of a supply of this serum should ask general practitioners and superintendents of fever hospitals to notify them of suitable patients who have consented to give some blood. It is obviously inadvisable to attempt to obtain the serum from children, as the amount which might be obtained would hardly justify the trouble of collection. Drawing off blood with aseptic precautions is not as simple as it sounds, and, except in the case of hospitals, would best be done by some doctor appointed for the purpose, who might well be a bacteriologist from the laboratory in which the serum is to be prepared. There it would be tested by the Wassermann test, and for sterility, pooled to give a more uniform standard of strength, and made up in doses ready for immediate dispatch. It will keep for many months if stored under proper conditions. The use to which it should be put must depend, of course, on the amount available, but the first consideration should be the protection of young children, who are known to have been exposed to infection, and in whom an attack of measles is particularly to be feared, either because of their age or because they are suffering from some other complaint. If the supply is ample, the serum might be used in ward outbreaks, or by giving a small dose late in the incubation period, merely to attenuate an expected attack, thereby allowing a lasting immunity to be developed without much risk. Any such supply should be available to all doctors in the district either in private or in hospital practice, and should not be restricted to those who have been able to recommend donors. A request to obtain volunteers issued with each dose would help to equalise the distribution of supply and demand, but children's hospitals would always tend to use more than they could supply. The expense of such a scheme should not be great, and would be well justified by the number of lives which would be saved.

Dr. Gunn and other writers have shown that it may be many years before a satisfactory animal serum is put on the market. In the meantime we must do what we can to save life with the material which is available. It should not be forgotten that the old-fashioned arm-to-arm inoculation against small-pox was an effective, if somewhat clumsy, method, and saved many thousands of lives. Our forefathers did not wait until sterile calf-lymph had been discovered.

I am, Sir, yours faithfully,

W. A. LETHEM,
Medical Officer.

Ministry of Health, Whitehall, Oct. 8th, 1928.

GENERAL MEDICAL COUNCIL: ELECTION OF DIRECT REPRESENTATIVES.

To the Editor of THE LANCET.

SIR,—I should be glad if you could publish a short statement in support of the candidature of Dr. E. A. Gregg and myself for election to the General Medical Council. We are asking for a definite mandate to carry a message to the Council from the general body of practitioners. This message asks that the existing constitution of the Council may be overhauled in the light of the defects which have emerged during its 70 years' existence. It suggests that a more adequate constitution should then be solicited from the Government of the day.

That such an overhaul is necessary scarcely needs arguing. Dr. H. G. Dain has pointed out one particular defect—namely, the very small representation of general practitioners. But the B.M.A. members of the Council, after the last election, issued a statement that even this suggestion had not their approval. The issue is therefore clear. On the one hand, Dr. Gregg and myself ask to be returned in order to do a definite task for the furtherance of the public welfare and that of the medical profession. On the other, two gentlemen already overburdened with various duties for the B.M.A., ask for support in order that they may increase the prestige of the B.M.A. One is bound to assume, since no other object has been announced in their name, that they propose to follow the policy of laissez faire which all B.M.A. candidates have followed hitherto.

I am, Sir, yours faithfully,

Sevenoaks, Kent, Oct. 7th, 1928. GORDON WARD.

A NEW NURSING HOME AND CLINIC FOR LONDON.

To the Editor of THE LANCET.

SIR,—The account of the new nursing home and clinic for London in THE LANCET of Oct. 6th is, as you state, incomplete. Unfortunately the scheme is not yet the accomplished fact which your article might suggest, as the difficulty of raising the necessary capital for an undertaking, which is in some part philanthropic, is very great. We hope to furnish you shortly with a detailed account of the proposed clinic.

On behalf of the advisory medical committee,
We are, Sir, yours faithfully,

H. MORELAND MCCREA,
Chairman.

WALTER HOWARTH,
Hon. Sec.

Devonshire-place, W., Oct. 9th, 1928.

DEATHS UNDER ANÆSTHETICS FOR DENTAL OPERATIONS.

To the Editor of THE LANCET.

SIR,—Dr. Boyall seems to me to place the care that should be taken by an anæsthetist for dental operations at a higher standard than is usually adopted. My own experience with the use of oxygen for a prolonged administration of any anæsthetic leads me to regard it as contra-indicated in any head operations, at any rate from the surgeon's point of view, on account of the tremendously increased hæmorrhage resulting therefrom.

I am, Sir, yours faithfully,

L. ERIC CHAS. PECKOVER.

Worthing, Oct. 9th, 1928.

THE PROPOSED BAYLISS-STARLING MEMORIAL.

To the Editor of THE LANCET.

SIR,—May I draw the attention of your readers to the fund which is being raised to provide a memorial to the late Profs. Sir William M. Bayliss and E. H. Starling. Many subscriptions have now been received from all parts of the world to this fund, and the committee is particularly grateful to those contributors in foreign countries who have so generously assisted. Although a considerable sum has now been received, this is not quite large enough to provide a good annual studentship.

In thanking those of your readers who have so generously assisted the fund, may I remind others who intend to do so that subscriptions may be sent to me at the address given below, cheques being crossed Bayliss-Starling Memorial Fund.

I am, Sir, yours faithfully,

C. LOVATT EVANS,
Secretary of Committee.

University of London, University College, Department of Physiology and Biochemistry, Gower-street, London, W.C.1, Oct. 5th, 1928.

LOCAL ANÆSTHESIA IN THE REDUCTION OF FRACTURES.

To the Editor of THE LANCET.

SIR,—With reference to the annotation on this subject in your issue of Sept. 22nd (p. 609), may I be allowed to add the following remarks?

For the last three years this has been the form of anæsthesia I have used for a good many of my private cases of forearm and leg fractures. I find it most useful for the Colles's and Pott's fracture cases, particularly for nervous ladies whose main fear is of the inhalation method. The solution I have always used is 0·5 per cent. novocaine in saline, with adrenalin. I strongly recommend this method of anæsthesia as being practical and as giving the patient the comfort of avoiding general narcosis. It is advisable in highly strung and nervous individuals to precede the local anæsthesia with a subcutaneous injection of morphia gr. ¼ and atropine gr. 1/100. The patient is recommended to go to bed after the operation. Should some unbearable pain occur hours after the reduction of the fracture—in these over-worried cases—I find aspirin or atophan very soothing. Using local anæsthesia I have several times noticed the extreme ease with which the bone fragments get replaced, particularly in the case of Colles's and Pott's fractures or fractures of the shaft of the tibia, even where the degree of impaction is very marked.

I am, Sir, yours faithfully,

A. H. BIZARRO, F.R.C.S. Eng.

Oporto, Sept. 25th, 1928.

"DENTAL MEDICINE."

To the Editor of THE LANCET.

SIR,—I am aware that an author must accept whatever comes from a reviewer, but it seems to me that in this instance your review of my book (THE LANCET, Sept. 22nd, p. 605) is the result of a misconception, both as to the object of the book and the matter which it contains. Your reviewer suggests that I have chosen quotations from medical literature which support my case, and have neglected others which militate against it. I would point out that my chapters on biochemistry were read and accepted by a competent biochemist, and the physiological arguments were submitted to a professor of physiology of International reputation before being brought forward.

My title, "Dental Medicine," is also objected to on the grounds that it is too extravagant, but the whole object of the book is to suggest that the practice of dentistry should not be limited to the surgery of the teeth simply, but that, if preventive measures are to be of any value, all the recent advances in medical science must be taken into account, and that there should exist a science of dental medicine in distinction to that of dental surgery. And, finally, your reviewer complains that I have given no figures to prove that there exists a disturbance in the acid-base equilibrium of the blood in dental caries and pyorrhœa alveolaris; yet my whole argument is, that in both these conditions it is not a disturbance of this which is the cause of the trouble, so much as that they are the natural result of the compensation of some change in acid-base balance, that in the vast majority of cases this compensation is so perfect that no change exists, or that this is so small that no biochemical methods at present known are delicate enough to show them.

This being so it would seem to be hardly fair to suggest that the book is not a fit one to be read by members of my own profession. The review appears to be the result of an imperfect appreciation of the subject matter of the book.

I am, Sir, yours faithfully,

Bournemouth, Oct. 6th, 1928. F. W. BRODERICK.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Lt. W. J. Rankine is transferred to the Emergency List.

Surg. Lt.-Comdr. H. Hurst to *London*.

Surg.-Lts. D. R. Bertram to *Keppel* and to *Ramillies*; T. C. H. Neil to *Keppel*; and F. M. B. Dolan to *Cornflower*.

ROYAL NAVAL VOLUNTEER RESERVE.

Proby. Surg.-Lt. T. C. Stevenson to be Surg.-Lt.

ROYAL ARMY MEDICAL CORPS.

Maj. W. J. Dunn retires on retd. pay on account of ill-health and is granted the rank of Lt.-Col.

Maj. B. H. C. Lea-Wilson is restored to the establishment.

Capt. A. K. Robb to be Maj. (Prov.).

ARMY DENTAL CORPS.

Lt. F. G. Arnold to be Capt.

REGULAR ARMY RESERVE OF OFFICERS.

Col. J. Poe, late R.A.M.C., and Lt.-Col. E. W. P. V. Marriott, having attained the age limit of liability to recall, cease to belong to the Res. of Off.

Lt.-Col. G. S. Parkinson to be Lt.-Col.

TERRITORIAL ARMY.

Lts. N. G. Hill and N. F. C. Burgess to be Capts.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Lt.-Col. (Bt. Col.) S. J. Fielding, from R.A.M.C., T.A., to be Col.

ROYAL AIR FORCE.

Flight Lt. R. J. K. Chattey is transferred to the Reserve, Class DII.

DEATHS IN THE SERVICES.

Col. Robert James Geddes, who died on Sept. 27th, at Westcliff, St. Andrews, aged 70, who was a graduate of Glasgow University, entered the Army Medical Service as surgeon in 1884, and after serving with the Burmese Expedition of 1886–89 (medals with two clasps), accompanied the Chin-Lushai Expedition, 1889–90 (clasp), and took part in the operations in Mekran, 1898. He took part in the relief of Kimberley during the South African War, 1899–1902, and was present during the operations in the Orange Free State, including operations at Paardeberg and the action at Driefontein (mentioned in despatches, Queen's medal with four clasps, and King's medal with two clasps, D.S.O.). He was promoted to Major in 1896, Lt.-Col. in 1901, and Col. in 1913. In the late war he was D.D. of Medical Services with the Second and Fourth Corps (twice mentioned in despatches and C.B.), and from 1917–19 he was Inspector of Medical Services in Scotland. He married in 1897 Christina, daughter of the late Mr. J. G. Whyte.

Obituary.

DIARMID NOËL PATON, M.D., LL.D., F.R.C.P. EDIN., F.R.S.

FROM 1906 until the end of last term Dr. Noël Paton was Regius Professor of Physiology in the University of Glasgow, and he was known to many generations of students as an admirable teacher and a man of outstanding personality. He died on Oct. 1st, the day on which his retirement became effective, and in remembering his many services as experimenter and organiser, the profession will especially recall his power of inspiring others in their work and his insistence on the medical application of what he taught.

PROF. NOËL PATON.

Photograph by Elliott & Fry, Ltd.

Eldest son of Sir Joseph Noël Paton, the artist, and nephew of Walter Hugh Paton, he was born at Edinburgh in 1859 and received his education at the Academy and the University there. As a student his talents were already obvious, and after winning the Baxter scholarship on graduating in science in 1880, he qualified in medicine with first-class honours in 1882. In the Royal Medical Society, of which he became President, he was noted for thoughtful contributions to the debates, and even then he showed a leaning towards the underlying principles of medicine. The tendency towards experimental work was confirmed by post-graduate studies at Vienna and elsewhere and by the award of a biological Fellowship at Edinburgh in 1884; but Paton nevertheless took resident appointments at the Royal Infirmary and the Royal Hospital for Sick Children, and gained the gold medal for his M.D. thesis in 1885. He became a lecturer and examiner in physiology in the University, at the same time carrying on medical practice on the staff of the Western Dispensary, but it was not until four years later that he found real scope for his ability. The Edinburgh Royal College of Physicians appointed him superintendent of its Research Laboratory—a post just vacated, after brief tenure, by Sims Woodhead—and here Paton was able to develop the work immensely, in collaboration with Sir John Batty Tuke, who was then curator. He collected around him a body of able investigators and gave them the benefit of his unusual powers as an organiser. Under his guidance the laboratory became of real value, not only as a place where accurate biological experiment was carried out, but also, by initiation of the reporting department, to medical practitioners at large. The subjects on which he chiefly worked at this time were problems of metabolism and haematology, and the physiology of the salmon, in connexion with which he served on the Royal Commission on Salmon Fisheries in 1900.

When Paton left Edinburgh for Glasgow in 1906 he took with him a high reputation for original work, and this reputation he maintained throughout the many years that followed. With his pupils he studied endocrine activities at a time when the subject had attracted relatively little attention, and his book on the "Nervous and Chemical Regulators of Metabolism," which appeared in 1913, contained a good many personal observations besides giving an illuminating account of what was then known about the ductless glands. In later years his attention turned more and more towards the problems of nutrition, at first in connexion with the life of the poor in Glasgow and subsequently in their relation to the scarcity of food during and after the war in this country and in Austria. In Glasgow he had every opportunity of studying rickets among the poorer classes living in tenements, and in course of time he was involved in somewhat controversial issues. For though he admitted that unhygienic surroundings and defective feeding predisposed to the disease, he strongly disputed the view that rickets was *caused* by the absence of an antirachitic factor in foodstuffs, being more impressed with the association of the disease with defective care, neglect of the home, and overcrowding. He became a leader of a school of thought on this subject, and it is, of course, only recently that further investigation of light and its effect on ergosterol has partially reconciled the opinions of this school with those of investigators who lay stress on the accessory food factor, vitamin D.

With Prof. Leonard Findlay Paton, was responsible during the last few years of his life for an elaborate study of the relations of poverty, nutrition, and growth, carried out by the Scottish Committee for Child Life Investigation. A consideration of overcrowding, underfeeding, and material inefficiency brought out the somewhat surprising fact that only the last of the three could be definitely correlated with the physical conditions of the children. Paton and Findlay set out to gain definite knowledge which would enable us to say what was the best approach to social problems as they affect the young—whether the large sums spent on child welfare and other schemes were directed into the best possible channels. They came to the conclusion that too much was being said about the ill-effect of environment and too little about the inadequacy of the slum-dwellers themselves. They found nothing to substantiate the view that "what is the matter with the poor is poverty."

The nature and scope of this work shows that Paton was far from being purely a laboratory worker; it reinforces our statement that he was keenly interested in the medical applications of physiology, and indeed their wider social applications. This conception he passed on to his students. It has been said of him that first his hearers liked the man and then they got to like the subject. Always immaculately dressed, resembling rather the artist than the doctor, he passed through difficulties with a graceful distinction that commanded respect. "Entering the class of physiology for the first time," writes one of his old students, "one was attracted by the dignified treatment of the subject and realised almost at once its fundamental importance to medicine. Clear in his language, Prof. Noël Paton was able to throw still more light on some of the difficulties by the almost magical way he was able to illustrate his points by diagrams. Moreover, he appreciated our difficulties and no trouble was too great for him in order that we should understand and appreciate the 'Institutes of Medicine.' His lectures were kept absolutely up to date; there was no soulless repetition of text-books. In this way we came to realise that knowledge had not reached finality, but was in its infancy. One thing and one thing alone he could not tolerate, and that was pretence in any shape or form. Honesty permeated his whole being and woe betide the student that pretended to understand. 'Some there are who know not and know not that they know not—Fools, shun them.' How we used to listen to these words booming through the class-room, and how we braced ourselves to the

task of escaping this classification! But Prof. Noël Paton had interests outside the class-room. There was no branch of student life which he did not appreciate, no problem which he did not ponder over. He was ever ready to give advice whether on apparatus for an experiment or on the choice of a career. His old students were always calling on him or writing to him and always they received courteous treatment with an honest opinion. His death has removed a friend and counsellor, but his memory remains with us as an inspiration."

Prof. Findlay writes: "My first meeting with Noël Paton was shortly after he came to Glasgow, when I approached him for permission to work at experimental pathology (the subject was rickets) in his department. He made me very welcome, as he has done many succeeding young graduates desirous of carrying on research. Paton was an admirable director of a department; he not only saw that one got all the facilities necessary, but he interested himself in all the work which was being done, gave freely of his own experience in the devising of experiments, in the collection of literature, in helping at operations on the animal, at which he was himself most expert, and in the final analysis and putting together of the results. The six volumes of 'Departmental Papers,' covering a wide field of physiology and experimental medicine, reveal the success with which his labours were attended. After a few years I was privileged to become one of his collaborators, an association which only terminated with his retirement from the professorship. Paton was an ideal co-worker; no one but could be enthusiastic in the search after the secrets of nature while working in his company; he always took a big share in the work himself; he had the faculty of giving criticism tactfully and the happy gift of taking criticism freely, so that the longer one was associated with him the greater did one's love and admiration for him become."

Prof. Noël Paton was elected a Fellow of the Royal Society in 1914 and was a member of the Medical Research Council from 1918 to 1923. He married in 1898 the daughter of the late Alexander Balfour, of Dawyck, in Peebleshire, where he later made his home. He is survived by his wife with one son and one daughter.

WILLIAM HUGH FENTON, M.D. BRUX., M.R.C.S. ENG.

WE have to record the death of Dr. Hugh Fenton on Oct. 5th at Hereford, where he was living in retirement. Born at Shardlow in Derbyshire in 1854, he was the son of a medical man, and entered Merton College, Oxford, in 1872 with a scholarship in natural sciences. He received his clinical training at the London Hospital, where he was surgical scholar and Duckworth Nelson prizeman in 1879, and became vice-president of the Medical Society. He also acted for a time as prosector at the Royal College of Surgeons. After qualification as M.R.C.S. Eng. in 1880 he held several resident appointments at the London Hospital, and then decided to specialise in diseases of the throat. But, after a period as resident medical officer and surgeon to the Throat Hospital, Golden-square, and as physician to the Throat Hospital, Great Portland-street, he abandoned laryngology in favour of obstetrics. In 1883 he took up an appointment as anæsthetist to the Chelsea Hospital for Women, and it was not long before he became private assistant to Dr. Palfrey, one of the fashionable gynæcologists of the time. When Palfrey died, Fenton took over his house in Brook-street and settled down as a practising gynæcologist there, subsequently moving to George-street, Hanover-square. In 1885 he had been elected assistant physician to the Chelsea Hospital, and in 1893 he became full physician. A year or two later the institution was reconstituted, but certain of the members of the old honorary staff were reappointed, and amongst them was Fenton, who was placed on the senior staff, having as his colleagues the late Dr. William Duncan, and Sir John Bland-Sutton. From that time onwards until his retirement by age in 1914 he devoted his best energies to the welfare and advancement of the hospital. "His professional work there," writes Mr. Victor Bonney, "will always be remembered by those who served with or under him, for the conscientious way in which it was carried out, with the result that without ostentation and in the most humble-minded spirit he accomplished a record of surgical achievement of which any man might feel proud. His skill as a diagnostician will perhaps best be remembered by those who worked with him, for he was certainly by far the most brilliant exponent of the art of vaginal examination that the writer has ever met. To posterity he will be known by two surgical instruments whose usefulness has stood the test of time, Fenton's double-ended cervical dilators and Fenton's 'bulldog' volsellum. But he was more than an able gynæcologist; he was a great practitioner. Beyond technical skill he had that wider outlook born of understanding and ready sympathy which raises our calling from science to an art, and few medical men have been so beloved by their patients as he was. His services to Chelsea Hospital for Women were very great, and the more so because they were given most freely at a time when the hospital most needed them. As a colleague he will be held in affectionate remembrance by all of us who had the good fortune to be associated with him. Entirely free from that petty jealousy which too often mars the character of able men, he held the work of his colleagues in generous appreciation. He was always kindly and helpful to every member of the staff from the lowest to the highest, and was exceedingly generous to those under him."

Early in his career, Dr. Fenton joined the Obstetrical Society and the British Gynæcological Society, and of the latter body he became successively secretary and vice-president. He was a keen sportsman, and was especially fond of fishing, which he was able to enjoy until the last year of his life. His wife, who survives him, was the eldest daughter of the late William Foster, of Hornby Castle, Lancaster.

JAMES THOMAS CURRIE LAING, M.B. EDIN., F.R.G.S.

Dr. J. T. C. Laing, who died in London on Sunday, practised in the Portman-square neighbourhood until about a year ago, when his health began to fail. A graduate of the University of Edinburgh, where he took the M.B. degree in 1892, he acted for a time as house surgeon at the Royal Infirmary and as assistant to Prof. Annandale, and then went out to Canada. He took part in the Klondyke gold rush, was appointed assistant surgeon to the Good Samaritan Hospital at Dawson City, and later went to South Africa as medical officer to the Canadian Scouts. Coming to London some twenty years ago, with but few acquaintances and only one or two friends, he built up a large practice by sheer hard work and by the force of his personality. "In his professional life," writes Sir John Thomson-Walker, "his chief characteristics were his whole-hearted devotion to his patients regardless of all personal consideration of leisure or fatigue, and his contagious optimism. His influence on the despondent patient was magical, and he was a tower of strength in long-continued chronic illness. Outside his professional work, but without doubt exerting an important influence upon it, he was a great sportsman, a keen golfer, and a steady game-shot, and, in his younger days, a footballer and a formidable boxer. . . . He was a born leader, and would have succeeded wherever responsibilities had to be shouldered or dangers faced. No one knew Jimmy Laing but felt the better for his friendship, and his passing will leave a blank in many lives." During the late war Dr. Laing was physician to the Royal Flying Corps' hospitals in Bryanston-square and Eaton-square, being mentioned in despatches for his services. He was also on the staff of the Princess Christian Hospital

for Officers. Early this year he journeyed to South Africa in an attempt to regain his health, but he found himself unable to continue his work, and spent the summer quietly in Scotland. He leaves a widow with a son and daughter.

Medical News.

UNIVERSITY OF CAMBRIDGE.—At recent examinations the following candidates were successful:—

DIPLOMAS IN PUBLIC HEALTH AND IN HYGIENE.

Part II.—Baharsing Jagatsing Ajwani, Manmohan Singh Batra, *Colin Fraser Brockington, Bertha Margaret Butters, Ryder Carrel Dracup, Margaret Ann Glass, Nityaranjan Gupta, *Sethi Indersen, John Leonard Graham Iredale, Girgis Abdel Messih, Jean Hall Morton, *Robert Arthur Welsford Procter, Effie Scott Stephen, Jagan Nath Vasudeva, Dorothy Watterson, Percival Clarence Wickremesinghe, *Kok Cheang Yeo.

* Passed with distinction.

UNIVERSITY OF LIVERPOOL.—At a recent examination the following candidates were successful:—

DIPLOMA IN PUBLIC HEALTH.

Enid Baile, C. A. Birch, Margaret W. Blackwood, R. T. Chadwick, and A. Wahid.

UNIVERSITY OF LONDON: *King's College.*—A course of nine public lectures on the Indebtedness of Industry to Pure Science will be given at King's College, Strand, on Wednesdays at 5.30 P.M., beginning on Oct. 17th, when Sir Oliver Lodge, F.R.S., will give an introductory address. Among the lecturers will be Mr. F. A. P. Aveling, D.Sc., who will speak on the Human Factor (Nov. 7th), and Prof. R. J. S. McDowall, who will speak on Physiology and National Efficiency (Nov. 14th).

BRITISH INSTITUTE OF PHILOSOPHICAL STUDIES.—A course of six lectures, entitled Four Great Philosophers and the Modern Outlook, and dealing with Descartes, Spinoza, Hume, and Kant, will be given by Prof. L. J. Russell at University College, Gower-street, on Tuesdays, at 5.45 P.M., from Oct. 16th onwards. A class giving an Introduction to Philosophy will be held by Mr. S. E. Hooper, the director of studies, on Wednesdays at 6 P.M. at the Royal Anthropological Institute, 52, Upper Bedford-place, London, W.C., in the Michælmas and Lent terms, beginning on Oct. 10th. A lecture on Race and Civilisation will be delivered at the Royal Society of Arts, 18, John-street, Adelphi, W.C., at 8.15 P.M., on Nov. 13th: and one on the Impact of America on Western Civilisation by Mr. S. K. Ratcliffe, at the same hour on Dec. 11th. The temporary offices of the Institute, where information can be obtained, are at 88, Kingsway, W.C. 2.

BRITISH EMPIRE CANCER CAMPAIGN.—Lord Reading presided for the first time as chairman of the Grand Council at its quarterly meeting held on Monday. A vote of sympathy was recorded on the death of Dr. Robert Knox, one of the founders of the campaign and a member of the Grand Council.

The following grants were approved:—£500 as a supplementary grant towards the maintenance of cancer research work being carried out at the Middlesex Hospital; £600 to the Cancer Research Committee of the London Association of the Medical Women's Federation for the salary of its research officer for one year; £200 to Mr. Nevill Willmer, of Manchester University, for the continuation of his research work; £50 to the Clinical Research Committee of Guy's Hospital towards the cost of an investigation on organic compounds of lead with a view to their therapeutic use; and a sum of £1500, spread over a period of three years, to the Middlesex Hospital for the salary of an assistant histologist.

A letter was received from the newly-formed International Cancer Committee, which has been set up to deal with the organisation of international conferences on cancer in future years, and the Grand Council nominated Mr. W. Sampson Handley, Dr. R. G. Canti, and Prof. Archibald Leitch as its representatives on this committee. It was stated that the final report upon the proceedings of the International Conference would be circulated in about three weeks' time.

The Grand Council elected Sir Thomas Horder as its representative on the Scientific Advisory Committee, which is nominated jointly by the Royal Society, the Medical Research Council of the Privy Council, and the campaign itself.

LONG FOX MEMORIAL LECTURE.—This lecture will be delivered by Dr. J. Odery Symes in the physiological lecture theatre of the University of Bristol at 8.30 P.M. on Tuesday, Oct. 30th. His subject will be the Relation of Erythema Nodosum to Tuberculosis and Other Diseases.

GUILD OF ST. LUKE.—The annual festival service of the Guild will be held in Westminster Abbey on Sunday Oct. 21st, at 6.30 P.M. The preacher will be Canon C. S. Woodward, and members of the medical profession are invited to attend, no tickets being required for admission to the service.

ST. GEORGE'S HOSPITAL DINNER.—The annual dinner of St. George's Hospital Medical School was held at the Hyde Park Hotel on the evening of Oct. 1st, with Dr. W. S. Fox in the chair. The Chairman was in his happiest vein when proposing the toast of "The School," and emphasised the many advantages that St. George's offers to the student, especially from the standpoint of individual clinical tuition.—The Dean, Dr. A. Feiling, in his reply, reviewed the work of the past year and drew attention to the high percentage of successes in the examinations of the College of Surgeons.—Sir Crisp English proposed the health of the "Orator of the Day," Sir John Bland-Sutton, who had, in the afternoon, delivered the inaugural address.—Sir John replied in a typically witty speech, which was evidently much appreciated by his auditors.—Later in the evening Mr. Rudyard Kipling recounted, in his inimitable manner, some of his experiences at the hands of the medical profession.

ST. MARY'S HOSPITAL DINNER.—Dr. E. G. Moon took the chair at the annual dinner at the Trocadero Restaurant on Oct. 5th. It was 40 years, he said, since he first attended the hospital dinner, and he thought he had been chosen as chairman because he had eaten more dinner than anyone else. Although St. Mary's Hospital was still young it had high traditions, and he was glad to see that they were being preserved to-day. The buildings, it was true, had somewhat changed, and now the Clarence Memorial wing rose where once Mr. and Mrs. Ed. Moss held out obstinately against all enlargement of the hospital premises. Kings and governments might fall and be forgotten, but he thought that the fame of Mr. and Mrs. Ed. Moss would go on for ever. In their window they had a notice—"Mr. and Mrs. Ed. Moss have left off clothing of every description"; and underneath this appeared the words: "Inspection Invited." To-day the place where their shop stood had become known, through the labours of Sir Almroth Wright and his assistants, throughout the entire world.—Responding to the Chairman's toast of the Hospital and Medical School, Lieut.-Colonel H. E. Verey, deputy chairman of the hospital board, referred to the regretted absence, through ill-health, of Mr. Prideaux, who had been a member of the board for 20 years and its chairman for 11. He also spoke of the death of Mr. Maynard Smith, and testified to his charming personality and invariable courtesy in debate. Last year the hospital had had a balance of about £2500 on the right side, and he saw no reason why with ordinary luck it should not have a balance on the right side again. But the addition of the two new operating theatres and 60 new beds meant an additional expenditure of £7500, and he trusted that all St. Mary's men would do their best to get new annual subscribers. The medical school needed rebuilding, a new nurses' home was wanted, and the hospital ought to have "pay beds"—the most crying need in London to-day.—Dr. C. M. Wilson, replying to the toast as Dean, said that the entry of students to the school was, as last year, in the middle 'forties. New buildings would cost £160,000, and this was a vast sum to get from the public, which was alleged to be apathetic to medical education. Nevertheless, the sum of £60,000 had been collected from this same public during a few weeks in the summer, largely owing to the enthusiasm of the pathological department led by Dr. John Matthews. He pleaded for more money; at the same time it must be remembered that the virtue of the institution lay not in the buildings, or even in the staff, but in the students.—The toast of "The Chairman" was proposed by Mr. V. Warren Low. When last he proposed this toast at one of these dinners, he said, the chairman in question had soon afterwards been made Governor of Queensland, and he would be sorry if anything he said should have a similar effect on Dr. Moon. As a physician, Dr. Moon displayed a wonderful clinical instinct and the soundest of common sense. In his work at schools he looked after hundreds of children whose parents had made a life-long study of medicine, and in this connexion Mr. Low was reminded of the saying, "The more I see of the average parent, the more I respect the average boy." In short, said Mr. Low, the chairman was a big man with a big mind, a big heart, and a very genial humour.—The toast was drunk with acclamation, and Dr. Moon briefly replied.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—A cheerful company celebrated, at the Hotel Victoria, on Oct. 3rd, the sixtieth anniversary of the passing of the Pharmacy Act, which, as the president aptly remarked, drew together chemists and druggists with members of the Society and established unity in pharmacy.—Sir Gregory Foster, who proposed the toast of the Pharmaceutical Society of Great Britain and its Benevolent Fund, commented, as Vice-Chancellor of the University of London, on the improvement in quality and calibre of the men and women entering for courses in pharmacy in the various schools, of which there were now no less than 25 connected with the Universities of London, Manchester, and Glasgow. In pleading for support for the benevolent fund, he pointed out that the calls made on this fund would be considerably reduced by the establishment of adequate superannuation funds for employees.—The President, Mr. Herbert Skinner, in his response, said that for 60 years the Society had been the authority for administering the poisons law of the country, and had carried out this duty fairly and loyally with the sole view of the protection of the public. The National Health Insurance Act of 1911 had made pharmacists dispensers to the nation. Under that Act sixty million prescriptions were dispensed annually. The Benevolent Fund was established in 1841; since then £250,000 had been subscribed and £180,000 disbursed. He asked for an additional £5000 to be collected during his year of office by the 114 branches of the Society throughout the country.—Mr. E. T. Neathercoat, proposing the Houses of Parliament, deplored the absence of any pharmacist among the members of this Parliament. It was hoped to remedy this defect. The tendency nowadays was to frame Acts in skeleton only, leaving the rest to be added by departmental regulations and Orders in Council. This was a departure from the practice current 60 years ago, and might or might not be a useful one. Any suggestion that the Pharmaceutical Society was out of date or no longer useful was refuted by its record of public service during the last 60 years.—Sir Geoffrey Butler replied, and Mr. L. Moreton Parry, the vice-president of the Society, proposed the health of the guests, who, apart from the speakers, included Prof. W. E. Dixon, Sir William Willcox, Surgeon Vice-Admiral Gaskell, Sir Wilfrid Sugden, M.P., Mr. Colin Smith, and Sir Arthur Robinson, the last of whom responded. He pointed out that the Pharmaceutical Society of Great Britain was one of the earliest examples of that self-government which had now been granted to dentists and nurses, and was being demanded by opticians, herbalists, and morticians. Sir Arthur Robinson endorsed what had been said as to the general level of performance by the members of the pharmaceutical profession under the National Health Insurance Act, and praised the enterprise which had led the Society to provide a laboratory and devise tests for biological substances coming under the Therapeutic Substances Act. He wished to add a word about the Retail Pharmacists Union, of which union doubtless many of those present were members. This union had performed successfully a very difficult act of statesmanship, and by their willing coöperation its members had become partners in a great national service.

DONATIONS AND BEQUESTS.—Mr. T. N. Macaulay, of Montrehall, President of the Sun Life Assurance Company of Canada, has contributed £8000 for endowment to the Lewis Hospital, Stornoway.—Croydon General Hospital has received £7500 from Mrs. Heath Clark out of the portion of the late Mr. Charles Heath Clark's estate set aside for charitable purposes.—Sir Louis F. Beeston, of Nottinghamshire, has given £5000 to the Nottinghamshire General Hospital for a new operating theatre.—Mr. James Walker Oxley, of Spenfield, Westwood, Leeds, banker, left £5000 4 per cent. Preference stock of the London Midland and Scottish Railway (value to-day about £3225) each to the Leeds Public Dispensary, the Leeds District Nursing Fund for the Sick Poor, and the Leeds Tradesmen's Benevolent Institution, in each case as a permanent endowment to be called the "James W. Oxley Bequest."—The Bolton Infirmary will benefit to the extent of £10,000 under the will of Mr. Colin Cooper, of Bolton and Manchester, accountant. The gift will be used in connexion with the proposed extension of the accommodation for patients.—Miss Fanny Dyke, of Caversham, Oxford, left £1000 to the Royal Berks Hospital to endow a bed.—Sir Henry Whitehead, of Hawkswood, near Baildon, Yorks, wool merchant, left among other bequests £10,000 to the Bradford Royal Infirmary, in addition to £10,000 given this year, and £10,000 each to the Bradford Royal Eye and Ear Hospital and the Bradford Children's Hospital. After personal and family legacies the residue of the property he left to the executors upon trust to pay at their discretion a sum not exceeding £20,000 for charitable objects in the City of Bradford to which he had not bequeathed a legacy, and the ultimate residue as the executors may determine for such charitable institutions in the West Riding of Yorkshire, recommending them to consider first the benefit of persons who through blindness or other infirmity are least able to help themselves.—Mr. William Thomas Brand, of Eaton-place, S.W., after legacies to his daughter and other relations bequeathed £250 each to St. George's Hospital, Guy's Hospital, the London Hospital, and the Freemasons' Hospital in Fulham-road. The residue to his daughter for life, and, subject thereto, £2000 each to the National Lifeboat Institution, St. George's Hospital, the London Hospital, and the Freemasons' Hospital; and the ultimate residue, after other bequests, equally between St. George's Hospital, Guy's Hospital, the London Hospital, the Freemasons' Hospital, the Middlesex Hospital, and the Westminster Hospital.—Mr. William Ernest Wimpenny, of Edgerton, Huddersfield, left among other bequests £1000 to the Huddersfield Royal Infirmary.

POST-GRADUATE COURSES IN NEUROLOGY.—A comprehensive series of neurological lectures and demonstrations is now beginning at the National Hospital, Queen-square, London, W.C. Details may be had from Dr. J. G. Greenfield, Dean of the Medical School.

MUNICIPAL MATERNITY HOME AT OLDHAM.—The corporation of Oldham has opened its first municipal maternity home, which is situated at Greenacres. It cost £9500, and will accommodate 12 patients, the charges being kept within the range of working people.

CREWE MEMORIAL COTTAGE HOSPITAL.—Princess Mary has opened an extension of this institution which has cost £20,000. The additions include a new 20-bed ward for men, a private ward, a new administrative block, X ray and ultra-violet ray departments, and improved accommodation for the staff. There are now, in all, 60 beds.

POST-GRADUATE TEACHING IN GLASGOW.—The programme of post-graduate classes in Glasgow from November to May has now been issued and may be had of the secretary of the Post-Graduate Association, at 9, Woodside-terrace, C. 3. Weekly demonstrations and special courses are to be given, and clinical assistantships are available for those who wish to make a detailed study of a specialty.

CONGRESS OF BALNEOLOGY.—The forty-fourth congress of the German Balneological Society will be held at Berlin under the chairmanship of Prof. Dietrich from Jan. 25th to 27th. This will mark the jubilee, the society having been founded in 1878, with its first congress in 1879. Particulars of the meeting may be had from the general secretary of the Society at Fraunshoferstrasse 16, Charlottenburg.

UNIVERSITY OF BRISTOL: *Association of Alumni (London Branch).*—The seventh annual dinner will be held on Nov. 2nd, at 7.30 for 7.45 P.M., at the English Speaking Union Club, Dartmouth House, Charles-street, Berkeley-square, London, W. Mr. Stanley H. Badock, Pro-Chancellor of the University of Bristol, will preside, and Sir George Oatley will be the guest of the evening. The hon. secretary of the branch is Dr. Elizabeth Casson, Holloway Sanatorium, Virginia Water, from whom tickets may be obtained.

EXTENSION OF THE RADCLIFFE INFIRMARY.—An appeal is being made for £120,000 for the enlargement of the Radcliffe Infirmary at Oxford. Mr. W. R. Morris, the president, who had already promised £40,000 for the provision of a new maternity department, has undertaken to give a further £40,000 on condition that the remaining £80,000 is raised by the appeal. The needs of the hospital are four new ward blocks, a new nurses' home, new operating theatres, a new electrical and massage department, increased accommodation for out-patients, a new laundry, and enlarged offices. During the last ten years the work of the institution has increased 50 per cent., and the weekly contribution scheme, which in 1920 produced £836, last year yielded over £28,000, and is still growing.

COMBINED YORKSHIRE ASSOCIATIONS OF SCOTTISH GRADUATES.—A dinner of this Association will be held at the Queen's Hotel, Leeds, on Friday, Oct. 19th, at 7 P.M. The guests of the evening will be the three Parliamentary representatives of the Scottish Universities, Sir George Berry, Mr. John Buchan, and Mr. J. M. Cowan. The chair will be taken by Mr. J. B. Baillie, Vice-Chancellor of Leeds University. All graduates of these Universities resident in Yorkshire, whether members of the various Associations or not, are invited to attend and to bring guests (including ladies) if they so wish. Tickets and any further information may be obtained from the Honorary Secretary of the Combined Dinner, Dr. William MacAdam, 40, Park-square, Leeds.

Dr. Lawrence Price has accepted an invitation to to become Mayor of Nuneaton for the coming year.

CONFERENCE ON LIGHT AND HEAT IN THERAPY.—The second International Conference on Light and Heat in Medicine, Surgery, and Public Health is to be held in the house of the University of London, South Kensington, from Monday, Oct. 29th, to Thursday, Nov. 1st. The programme now issued indicates that many different aspects of the subject will be covered. Papers will deal with the use of light therapy in specific conditions—e.g., surgical tuberculosis (Sir Henry Gauvain), pulmonary tuberculosis (M. Weinbren), skin affections (W. J. O'Donovan), dental caries (F. Talbot); others with new methods and apparatus, and with the physical characteristics of equipment—e.g., a general consideration of ultra-violet apparatus (W. K. Russell), new electrotherapeutic apparatus (C. B. Heald), and the efficiency of various ultra-violet light producers (T. C. Angus); others again with photosensitisation (A. Eidinow), and plant pigments in relation to it (C. C. Morrell). Among the distinguished foreign visitors who will read papers will be Dr. A. J. Cemach, of Vienna (Ultra-violet therapy in oto-rhino-laryngology), Dr. Franz Nagelschmidt, of Berlin (A new method of applying heat by diathermy and Foam treatment), Dr. Wm. Flaskamp, of Prof. Wintz's clinic at Erlangen (Light and heat in gynæcology), and Dr. M. J. Dorcas, of Cleveland, U.S.A. (Distribution of energy from various types of arcs). All medical men are invited to attend and participate in the discussions. The conference is organised by the *British Journal of Actinotherapy*, 17, Featherstone-buildings, London, W.C. 1, from whom invitation cards, programmes, and vouchers for reduced rail fare may be obtained on application. An exhibition of apparatus, accessories, and adjuvants for light and heat therapy will be held in halls adjoining the conference room. The exhibition, which will remain open from 2.30 to 9.30 P.M. each day (last day, 6 P.M.), will be formally opened at 2.30 P.M. on Monday by Sir John Snell, chairman of the Electricity Commissioners, with Lieut.-Colonel F. E. Fremantle in the chair. Demonstrations will be given on the irradiation of milk and the detection of ringworm by the U.-V. lamp.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED SEPT. 29TH, 1928.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 94 (last week, 113); scarlet fever, 2329 (last week, 2097); diphtheria, 1228; enteric fever, 74 (last week, 88); pneumonia, 769; puerperal fever, 33; puerperal pyrexia, 112; cerebro-spinal fever, 6; acute poliomyelitis, 13; acute polio-encephalitis, 3; encephalitis lethargica, 18; dysentery, 14; ophthalmia neonatorum, 93. No case of cholera, plague, or typhus fever was notified during the week. The return for enteric fever includes 20 cases of paratyphoid fever, of which 12 were notified in London.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Oct. 2nd-3rd was as follows:—Small-pox, under treatment, 16; scarlet fever, 1925; diphtheria, 1534; enteric fever, 63; measles, 68; [illegible] puerperal fever, 20 (plus 15 babies); [illegible] 71; poliomyelitis, 2; "other diseases," 16. At St. Margaret's Hospital there were 15 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there were no deaths from small-pox, 3 (0) from enteric fever, 5 (0) from measles, 3 (3) from scarlet fever, 21 (4) from whooping-cough, 28 (5) from diphtheria, 160 (36) from diarrhœa and enteritis under two years, and 33 (4) from influenza. The figures in parentheses are those for London itself.

The fatal cases of enteric fever were reported from Southampton, Wallasey, and Middlesbrough. One fatal case of measles was reported from Wolverhampton, 1 from Birmingham, 1 from Manchester, and 2 from Liverpool, whilst 6 were reported from Belfast. Liverpool reported 3 fatal cases of whooping-cough and Salford reported 2. The number of deaths from diarrhœa and enteritis continued to increase; Liverpool reported 18, Newcastle-on-Tyne 9, Manchester, Leeds, and Birmingham 7, and Wolverhampton, Leicester, Nottingham, and Cardiff 5 each.

The number of stillbirths registered during the week in the great towns was 273 (corresponding to a rate of 43 per 1000 births) including 52 in London.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Oct. 16th.—5.30 P.M., General Meeting of Fellows and Ballot for election to the Fellowship. 8.30 P.M.: PATHOLOGY. Presidential Address: Prof. A. E. Boycott: The Transition from Live to Dead: the Nature of Filtrable Viruses.

THURSDAY.—5 P.M. (Cases at 4 P.M.): DERMATOLOGY. Dr. H. W. Barber: (1) A Case of White Spot Disease. (2) Raynaud's Disease with Calcareous Nodules. (3) Confluent Lichen Nitidus. Dr. J. E. M. Wigley: Two Cases of Acne Agminata (with sections). Other cases will also be shown.

FRIDAY.—8 P.M.: OBSTETRICS. Specimen: Mr. A. C. Palmer, Carcinoma of the Vagina in a Patient aged 24. Introductory Address by the President, Dr. J. S. Fairbairn. Paper: Dr. Dougal Bissell (New York): Genito-urinary Fistula in the Female, with an appreciation of Sims and his work. 8.30 P.M.: ELECTROTHERAPEUTICS. Presidential Address: Dr. J. E. A. Lynham: Some Difficulties in Radiation Therapy.

INSTITUTE OF HYGIENE, 28, Portland-place, W.

WEDNESDAY, Oct. 17th.—3.30 P.M.: Dr. C. S. Thomson: The Causes, Symptoms, and Prevention of Nervous Breakdown.

INTERNATIONAL SOCIETY OF MEDICAL HYDROLOGY.

MONDAY, Oct. 15th.—At Buxton. Discussion: Rheumatism as a National Problem; the Clinic for Rheumatism.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, Cavendish-square, W.

THURSDAY, Oct. 18th.—Preceded at 7.45 P.M. by an Exhibit of Surgical Armamentaria of Ancient and Modern India (from the Wellcome Historical Medical Museum). 8.15 P.M.: Lieut-Colonel Sir Frank Powell Connor: The Surgical Aspects of Tropical Diseases, with some Remarks on the Conditions under which Surgery is Practised in the Tropics.

SOCIETY FOR CONSTRUCTIVE BIRTH CONTROL.

WEDNESDAY, Oct. 17th.—8 P.M., at Essex Hall, Strand. Dr. M. Beddow Bayly: Voronoff and His Rejuvenation Experiments.

TUBERCULOSIS ASSOCIATION.

WEDNESDAY, Oct. 17th.—At the House of the Royal Society of Medicine, 1, Wimpole-street, W. 5.30 P.M.: Prof. R. H. Plimmer: Recent Work on Vitamins. 8 P.M.: Discussion on Artificial Pneumothorax Treatment from Different Aspects.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.

MONDAY, Oct. 15th.—5 P.M., Sir Arthur Keith: Problems in Human Anatomy which arise out of the identification of a skull attributed to Lord Darnley.—Demonstration, illustrated by specimens.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Oct. 15th, to SATURDAY, Oct. 20th.—FELLOWSHIP OF MEDICINE, Medical Society of London, 11, Cavendish-square, W. Mon., 5 P.M.: Lecture by Mr. C. Max Page on Some Points in the Treatment of Fractures.—CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C. Intensive course.—CHELSEA HOSPITAL FOR WOMEN, Arthur-street, S.W. Second week of special course in Gynæcology.—HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C. Special morning course.—HOSPITAL FOR DISEASES OF THE THROAT, Golden-square, W. Wed.: special clinical demonstration by Mr. Jefferson Faulder at 3 P.M. No Fee.—ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, Leicester-square, W.C. Wed., 4 P.M. Special demonstration by Dr. G. B. Dowling. No fee.—WELLCOME MUSEUM OF MEDICAL SCIENCE, 33, Gordon-street, W.C. Wed., at 4 P.M. Dr. S. H. Daukes: The Transmission of Helminthic Diseases. Free.
Further particulars from the Secretary.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, Oct. 15th.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Simmonds: Surgical Out-patients.

TUESDAY.—11 A.M., Mr. Endean: Venereal Diseases (Demonstration). 2 P.M., Dr. Shaw: Medical Out-patients. 4.30 P.M. (Special Lecture) Dr. Scott Pinchin: Cardiac Irregularities.

WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards, 2 P.M., Mr. Tyrrell Gray: Operations. 2.30 P.M., Mr. Donald Armour: Surgical Wards.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 2 P.M., Dr. Ironside: Medical Out-patients. 2 P.M., Mr. Bishop Harman: Eye Department. 4.30 P.M. (Special Lecture): Mr. Tyrrell Gray: Gastric and Duodenal Ulcer.
FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department.
SATURDAY.—9 A.M., Mr. Vlasto: Operation on Throat, Nose and Ear. 9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Diseases of Children.
Daily 10 A.M. to 5 P.M., Saturdays 10 A.M. to 12 noon. Medical and Surgical In-patients and Out-patients. Operations, Special Departments, Anæsthetic Course.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, Oct. 15th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.
WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin and Eye Clinics. Operations.
THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.
FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases. Clinics. Operations.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY, Oct. 16th.—5 P.M.: Dr. H. W. Barber: Bacteriology and Mycology.
THURSDAY.—5 P.M.: Dr. I. Muende: Pathology Demonstration.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, Oct. 18th.—4 P.M.: Mr. Barrington-Ward: Chronic Intestinal Obstruction.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.
TUESDAY, Oct. 16th.—3.15 P.M.: Dr. H. C. Semon: Fungus Infections of the Hands and Feet.

UNIVERSITY COLLEGE, Gower-street, W.C.
MONDAY, Oct. 15th.—5 P.M.: Prof. E. B. Verney: Urinary Secretion. (First of six lectures).
FRIDAY.—5 P.M.: Prof. J. C. Drummond: Recent Work on Vitamins (Second Lecture).

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.
WEDNESDAY, Oct. 17th.—4 P.M.: Dr. Graham Little: The Health of the Medical Practitioner.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.
TUESDAY, Oct. 16th.—4.15 P.M.: Dr. F. E. Tylecote: Asthma: Recent Research and the Work of the Asthma Research Council.
FRIDAY.—4.15 P.M.: Dr. D. P. Sutherland: Some Complications of Pulmonary Tuberculosis and Their Treatment.

ANCOATS HOSPITAL POST-GRADUATE LECTURES, Mill-street, Manchester.
THURSDAY, Oct. 18th.—3.45 P.M., Dr. W. J. S. Reid: Diseases of Sympathetic Nervous System.

Appointments.

ALDERSON, C. R., L.R.C.P.Lond., M.R.C.S., has been appointed Certifying Surgeon under the Factory and Workshop Acts for Eastbourne District.
EATON, A. H. M., M.B., B.Ch. Belf., Surgeon to the Tyrone County Hospital.
TAYLOR, John F., M.D., B.Chir. Camb., Pathologist, Lecturer in Pathology and Curator of the Museum, St. George's Hospital.

Vacancies.

For further information refer to the advertisement columns.
Bethlem Hospital, Lambeth-road, S.E.—Two H.P.'s. Each £25
. . . *l Infirmary.*—Res. Asst. M.O. £200.
. . . —H.S. and H.P. Each £150.
. . . *County Hospital.*—Cas. H.S. £120.
. . . *ty and Women's Hospital.*—Res. H.S. £130.
Burnley County Borough.—Asst. M.O.H., &c. £600.
Bury County Borough.—Asst. M.O.H., &c. £600.
Carlisle, Cumberland and Westmorland Mental Hospital.—Deputy Med. Supt. £500.
Chelmsford, Essex and Colchester Mental Hospitals.—Pathologist. £800.
Chester Royal Infirmary.—Honorary Surgeon.
Chesterfield and North Derbyshire Royal Hospital.—Cas. H.S. At rate of £100.
Dunedin, New Zealand, Otago University.—Professor of Pathology. £1000.
East London Hospital for Children, &c., Shadwell, E.—H.S. At rate of £125.
Elizabeth Garrett Anderson Hospital, Euston-road.—Ophthalmic S. Also Asst. S. to Throat, Nose and Ear Dept.
Essex County Council.—Male Asst. Tub. O. £700.
Halifax, Royal Halifax Infirmary.—3rd H.S. At rate of £100.
Hertford County Hospital.—H.P. At rate of £150.
Hull Royal Infirmary.—Asst. H.P. At rate of £130.
King's College Hospital, Denmark-hill, S.E.—Jun. Neurologist.
National Hospital, Queen-square, W.C.—Registrar. £200.
Northampton General Hospital.—Hon. Dental Surgeon.
Portsmouth, St. Mary's Infirmary, Institution, &c.—Third Asst. Res. M.O. £250.
Norwich, Jenny Lind Hospital for Children.—Res. M.O. At rate of £150.
Oswestry, Shropshire Orthopædic Hospital and Agnes Hunt Surgical Home.—H.S. £200.
Redhill, Surrey, Royal Earlswood Institution.—Jun. Asst. M.O. At rate of £250.
Rochester, St. Bartholomew's Hospital.—Third Res. M.O. At rate of £175.
Royal Dental Hospital of London, Leicester-square, W.C.—Hon. Med. Officer to Electro-Therapeutic Dept.
Royal Eye Hospital, St. George's-circus, Southwark, S.E.—Res. H.S. and Asst. H.S.
Royal Free Hospital, Gray's Inn-road, W.C.—Sen. Res. M.O. £150.
Royal Northern Hospital, Holloway, N.—Anæsthetist. £10 10s.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—H.S. At rate of £100.
St. Luke's Hospital, Cale-street, Chelsea, S.W.—1st Asst. M.O. £400.
St. Thomas's Hospital, S.E.—Asst. Pathologist. £450.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—Reg. £100.
Sheffield University.—Asst. Bacteriologist. £300.
Shrewsbury, Royal Salop Infirmary.—Res. H.S. At rate of £160.
Shanghai Municipal Council.—P.H. Dept. Asst. Radiologist. 700 Taels a month.
Southampton, Royal South Hants and Southampton Hospital.—H.P. £130.
Wigan, Royal Albert Edward Infirmary and Dispensary.—Hon. Asst. S. to Ophth. and Aural Department. £100.
Wolverhampton and Staffordshire Hospital.—Cas. O. and Anæsthetist. At rate of £125.
Wolverhampton, Wolverhampton and Midland Counties Eye Infirmary.—H.S. £200.

The Chief Inspector of Factories announces vacant appointments for Certifying Surgeons at Crewe (Cheshire) and Thornbury (Gloucestershire).

Births, Marriages, and Deaths.

BIRTHS.

MCCREDIE.—On Oct. 2nd, at Academy-street, Stranraer, the wife of Peter A. McCredie, M.B., Ch.B., F.R.C.S., of a daughter.

MARRIAGES.

BURN—PEMBERTON.—On Oct. 4th, at St. George's, Bloomsbury, J. Harold Burn, M.D. (Camb.), to Katharine Frances, youngest daughter of the Rev. Robert and Mrs. Pemberton, of Ingatestone, Essex.
COLLIE—ARROL.—On Oct. 1st, at St. Andrew's Presbyterian Church, Frognal, London, Sir John Collie, C.M.G., M.D., to Lady Arrol, widow of Sir William Arrol.
MITCHINER—PHILPOTT.—On Oct. 6th, at the Chapel Royal, Hampton Court Palace, Philip Henry Mitchiner, M.D., M.S., F.R.C.S., eldest son of Mr. and Mrs. Mitchiner, of Redhill, to Margaret, only daughter of Mr. Basil H. Philpott, M.V.O., and the late Mrs. Philpott, of Surbiton.
OGIER WARD—JONES.—On Oct. 5th, 1928, at St. Marylebone Church, Ronald, only son of Dr. and Mrs. Allan Ogier Ward, of Addlestone, to Elsie Antoinette, daughter of David and Mrs. Jones, of Llandilo.
WALSH—HARLEY.—On Oct. 6th, at the Church of Our Lady and St. Thomas of Canterbury, Harrow-on-the-Hill, Hugh Paul Walsh, M.B., to Sheila Patricia, only daughter of Dr. and Mrs. H. R. Harley, of Harrow.

DEATHS.

FENTON.—On Oct. 5th, at Litley Court, Hereford, after a long illness, William Hugh Fenton, M.D., in his 74th year.
LAING.—On Oct. 7th at Montagu-street, London, J. T. C. Laing, M.B., C.M., F.R.G.S., aged 57.
REED.—On Oct. 6th, suddenly at Exmouth, William Cash Reed, M.D., in his 78th year.
RUTHERFURD.—On Oct. 2nd, at a sanatorium, James Edmund Rutherfurd, M.D., M.C., late Captain R.A.M.C., aged 52.
SPENCE.—On Oct. 1st, at St. Matthew's-road, St. Leonards-on-Sea, James Beveridge Spence, M.D., O.B.E., for 43 years Medical Superintendent of the County Mental Hospital, Burntwood, Lichfield, aged 79.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

OBSERVATIONS ON THE SELECTION AND STANDARDISATION OF SURGICAL INSTRUMENTS.

By A. H. Tubby, C.B., C.M.G., M.S. Lond.,
CONSULTING SURGEON, WESTMINSTER HOSPITAL.

II.*—On the Use of Stainless Steel.

The introduction of stainless steel has revolutionised many industries, and its practical value as a labour-saving device is exceedingly great. If it were employed in the manufacture of surgical, orthopædic, dental, and veterinary instruments it would effect a great economy of time, labour, and expense, because it does not rust or tarnish; it retains its brightness when exposed to most, if not all, the agents used in surgical work, and it saves the cost of frequent re-nickelling. Its essential feature is the large percentage of chromium in its composition. A comparative table of percentage compositions will show at once the differences between stainless and shear carbon-steel.

—	Carbon	Manganese	Silica	Sulphur	Phosphorus.	Chromium
Carbon shear steel	0·8 to 0·95	0·05	0·07	0·01	0·01	Nil.
Stainless steel	0·3	0·3	0·12	0·02	0·02	13

The Hardening of Stainless Steel.

The cutting properties of a knife made from shear carbon-steel depend chiefly upon the hardening and the method of tempering. Dr. Hatfield remarks that if "a knife is too hard, obviously it is because it has not been sufficiently tempered. If it is too soft, it is because either (1) it has not been properly hardened, or (2) it has been over-tempered, always provided the steel is of correct composition. Stainless steel may be hardened in air or water and tempered to various degrees of hardness as required for the purposes for which it is intended. Whereas carbon tool-steel is hardened at temperatures from 760° to 780° C. for the maximum hardness to be obtained, with stainless steel the temperature for effective hardening is higher, and it is recommended that temperatures between 950° and 1000° be used. These temperatures must be registered very precisely by a thermo-electric pyrometer."

Roughly, however, carbon-steel is hardened at a red heat and stainless steel at an orange yellow, when it forms a "solid solution" of its constituents just as carbon steel does. It is the discovery of this essential fact, made in the Brown-Firth Research Laboratory at Sheffield, which has rendered the practical use of stainless steel possible for cutting and many other purposes.

In making stainless steel knives quenching should, according to Dr. Hatfield, always be done in water, as with ordinary steel knives. In heating for hardening, the bolster and tang of the knife should not be heated to the hardening temperature, but kept as cool as possible. This is especially important with stainless knives.

Tempering, Annealing, and Grinding Stainless Steel.

Stainless steel knives can be satisfactorily tempered, after quenching, by placing them in an oil bath between 100° to 150° for five minutes.

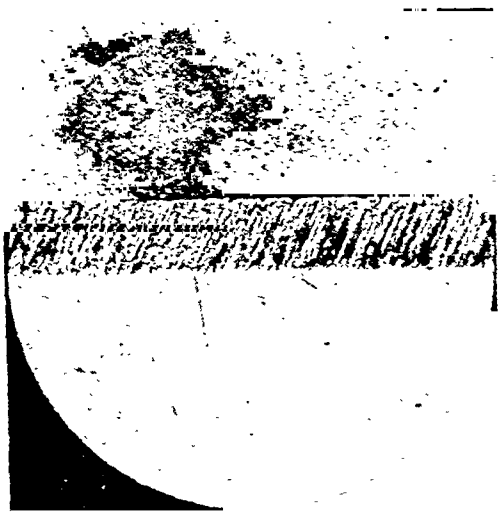
Some instruments must be softer than knives, and this result is obtained by partially annealing or softening. On this point Dr. Hatfield writes as follows: "If stainless steel is cooled in air from the hardening temperature, then it is very hard. If it is to be softened, it should be kept at the temperature approximating to that commonly employed for hardening shear carbon-steel blades (750°–760° C. is the best). After maintaining this temperature for a sufficient length of time, always to be determined by one's own experience, the knives can then be quenched in water and will be serviceable for any of the operations where the soft and ductile condition is required."

Grinding is a very important item and should be done very carefully, or otherwise considerable heat is developed, quite sufficient to soften unduly the edge of a knife or other cutting instrument.

Effects of Various Reagents on Stainless Steel.

Dr. W. H. Hatfield and his colleagues have made numerous experiments at the Brown-Firth Research Laboratories, and the results are set forth in a small volume entitled "The Development of Stainless Steel: Its Properties and Uses." Their tests included exposure to acids of many kinds, alcohol and alcoholic fluids, alkaline reagents, gases, and many components of cookery. The steel has come out triumphantly. It appeared to me, however, that before the use of stainless steel for surgical and dental purposes is advocated it should be subjected to experimental investigation of the effects on it of the processes involved in sterilisation; and that the results of the exposure of the steel to various antiseptic substances used in surgical procedures should be ascertained. I accordingly drew up a scheme of experiments on stainless steel with especial reference to surgical work, and sent it to Dr. Hatfield, who kindly undertook the experiments. The report of his results is given in full.

Fig. 1.



Knife No. 1.

Fig. 1.—The edge of stainless steel knife No. 1 (×100 and hardness 540), after being used twice on soft tissues and not re-sharpened. The edge of the knife is seen to be in excellent order along its whole length.

Cylinders of stainless F.H. steel (stainless cutlery steel used for the manufacture of stainless knives); stainless F.G. steel (high tensile stainless steel, complying with the mechanical properties required for specific engineering purposes); stainless F.M. steel (malleable stainless steel prepared for cold pressing and for other purposes where the rust-resisting property is desirable in conjunction with considerable toughness), and F.I. (stainless iron), polished to 000 emery paper, were placed in the following media for the periods stated:—

1. Prolonged boiling, up to 20 minutes in tap water to which about one teaspoonful of sodium bicarbonate to the pint had been added—the surface was unaffected.

2. Immersed in absolute alcohol for half an hour—all samples unaffected.

3. and 4. Immersed in "ordinary trade" methylated spirits for one hour, also in rectified spirit for one hour—all samples unaffected.

5. and 6. Immersed in pure lysol, also in 1 in 40 lysol solution each for one hour—all samples unaffected.

7. Immersed in pure carbolic acid for one hour—all samples unaffected.

8. and 9. Immersed in 1 in 20 and 1 in 40 carbolic solution each for two hours—all samples unaffected.

10 to 13. Immersed in mercuric iodide solutions 1 in 2000, 1 in 3000, 1 in 4000, and 1 in 5000 for two hours—all samples unaffected.

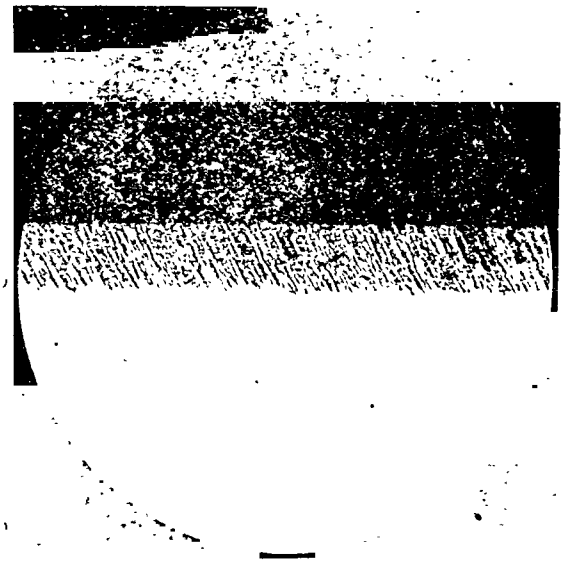
14, 15, 16, and 17. Immersed in mercuric cyanide solutions 1 in 2000, 1 in 3000, 1 in 4000, and in 5000, each for two hours—all samples unaffected.

18. Immersed in mercuric chloride solution 1 in 2000 for two hours—whitish spots appeared on the cylinders, most marked in F.H. (qv); practically none on F.M. F.H. (loss in grammes per sq. cm. of surface area = 0·0001; F.G. = 0·0001; F.M., nil; F.I. = 0·001.

* Part I. appeared last week.

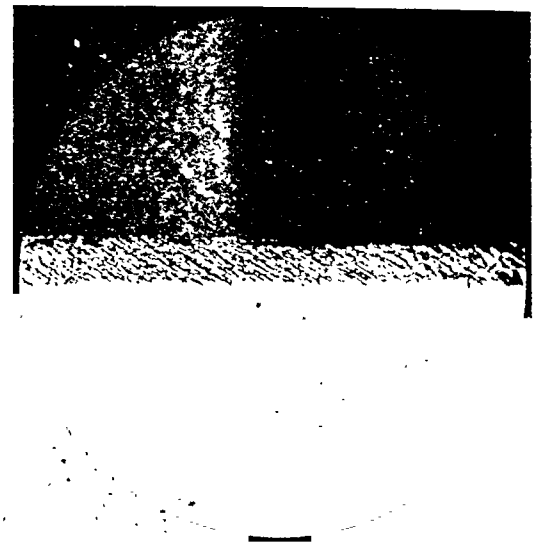
19. Immersed in mercuric chloride solution (1 in 3000) for two hours, loss of F.G. = 0·0001 and of F.H. = 0·0001; spotting similar to that of No. 18, but less marked. F.M. loss = nil and F.I. loss = nil; practically unaffected.

FIG. 2.



Knife No. 2.

FIG. 3.



X

Knife No. 2.

FIGS. 2 and 3.—Fig. 2, the edge of stainless steel knife No. 2 (× 100 and hardness 567) after use in two consecutive operations on bone. The edge was found to be good nearly up to the point, but as seen in Fig. 3 (x) there is a slight indentation towards the point.

20. Immersed in mercuric chloride solution (1 in 4000) for two hours. Only the faintest indications of whitish spots. F.M. and F.I. were practically unaffected.

21. Immersed in mercuric chloride solution (1 in 5000) for two hours. No visible effect on any of the types of stainless steel.

22. Immersed in 0·6 per cent. sodium chloride solution for three days. All samples unaffected.

This series of experiments shows that not one of the processes or reagents had any effect upon stainless steel except mercuric chloride solution, and that only in 1 in 2000, 1 in 3000, and 1 in 4000 solutions after two hours' exposure, which may be considered a reasonable length of time for an intricate surgical operation.

FIG. 4.

Knife No. 3.

FIG. 4.—The edge of stainless steel knife No. 3 (× 100 and hardness 515), which was used twice in operations on bone in an adult. The edge generally was found to be in a very good condition, but there were a few indentations.

23. The reaction of stainless steel to iodine has been the subject of another series of tests made at my suggestion by Dr. Hatfield and his colleagues. Stainless steel samples were immersed in an aqueous solution of iodine to which potassium iodide had been added. The solutions had the following strengths :—

1. 1·27 g. iodine and 5 g. KI. per litre.
2. 12·7 g. „ 5 g. „

The samples were immersed to half their height, and after seven days' immersion there was no attack visible on the portion immersed, but the surface above the solution was badly corroded in each case. It would seem to be the iodine vapour, and not the iodine solution, which has the corrosive effect.

We are not likely to expose instruments for seven days to iodine solution, and we do not use it as a means of sterilising or cleansing our instruments.

24. Boric acid in 50 per cent. and 5 per cent. solutions has no effect after seven days, and

25. Acetone only after several days, not under 14.

26. Cow's and sheep's blood is totally without effect even after 14 days.

27. Novocaine is largely used in dental practice, chiefly as an injection. In order to test the suitability of stainless steel for injection needles, they were placed in the following solutions :—

1 grain of novocaine in 5 c.cm. of water.
1 grain „ „ absolute alcohol.

At the end of seven days a slight film of rust had formed on both samples. This was completely removed by washing, leaving the surface quite unaffected, with the exception of a slight corrosion at the point of support of the sample in the aqueous solution.

28. The contact of two metals in the presence of an electrolyte often causes pitting, corrosion, and other changes, and stainless steel is not an exception.

29. Formaldehyde or formalin is occasionally used for surgical purposes and more often for dental procedure. It is interesting to note that after seven days 50 per cent. and 5 per cent. solutions of formic acid cause considerable corrosion of stainless steel.

Stainless Steel Knives.

The usual comment is: "We know they do not stain nor rust, but they are blunt and will not cut, and what is

worse they cannot be sharpened." † Experiments and investigations have clearly proved that if such knives are properly manufactured they are equal to any other cutlery in cutting properties; further, that for surgical purposes they are quite as good as the ordinary carbon steel knife, except when unusual hardness is required. If stainless steel knives are hardened at 950–1000° C. and are tempered in an oil bath at 180° C. for five minutes, they attain a hardening index quite sufficient for all ordinary purposes and are available for surgical work.

Dr. Hatfield kindly had made for me three surgical knives of stainless steel, and I submitted them to the tests of operation. Knife No. 1 was used for two operations on soft tissues only, and did not come into contact with bone. It was placed twice in methylated spirit for ten minutes and was employed for two consecutive operations: (1) For the removal of a large nævus from a small child; (2) to incise the inflamed soft tissues of an adult. Knives Nos. 2 and 3 were used for operations involving the removal of bone from an adult. * The periosteum was divided and dissected from the affected area and the edge of the knife was firmly pressed against the bone. Care was taken not to spare the cutting edge of the knives, all of which were made from the same bar of stainless steel. Dr. Hatfield reported upon the knives after being used as described:—

Examination of Edges.—Knife No. 1: After being twice used on soft tissues and not re-sharpened, the edge of the knife was found to be excellent along its whole length, as shown when magnified by 100 diameters (see Fig. 1). Knife No. 2: This was found to be very good up to the spot as shown in Fig. 2, but towards the point of the knife there was a slight indentation of the knife as shown in Fig. 3. Knife No. 3: The edge was found to be in a very good condition, but there were a few small indentations as shown in Fig. 4

Hardness Test.—After being used for operating each knife was examined and the Brinell hardness value was determined. The result of the tests being as follows:—

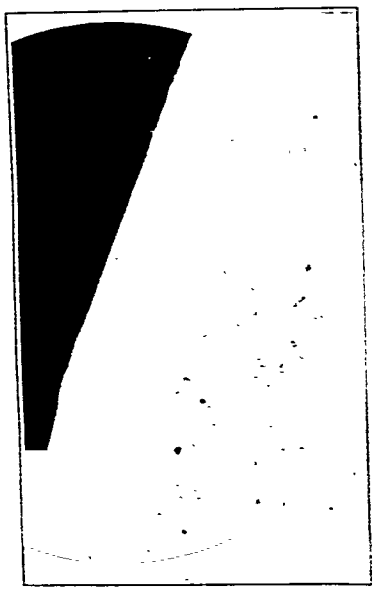
No.	Blade.	Haft.	No.	Blade.	Haft.	No.	Blade.	Haft.
1	540	230	2	567	—	3	515	246

* It is difficult to ascertain how these fallacies have been spread abroad. They may have arisen owing to the innate conservatism of some workmen, who frequently distrust a new material and will not take the trouble to learn either its composition or the proper method of working it. This would explain why so many stainless steel table-knives have been placed on the market with blunt edges, and from this fact have arisen the unfortunate ideas that stainless steel knives do not need sharpening, and that if they are sharpened they will become blunt at once. Experience has proved these suppositions to be incorrect. The writer has in his possession a stainless steel pocket-knife which he has used for all kinds of purposes, even to the cleaning out of tobacco-pipes, and yet it has retained a useful edge for two years.

Thus showing that if made of stainless steel of proper composition, hardening and tempering, blades with a hardness of 515–565 are sufficiently sharp and durable for surgical work, and that they fulfil the requirements of ordinary wear and tear in practice. For the very highest type of surgical knife, such as those used in cataract operations, I should, however, always prefer a knife made from shear carbon-steel, because the keenest possible edge can be obtained with this material.

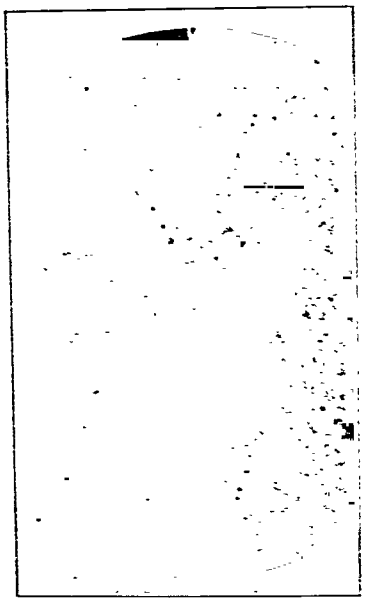
Blade Angles.—There are two angles to be considered in each blade, the first being the angle formed on the blade as a whole and the second the cutting angle ground on the edge of the blade: the latter being the actual cutting angle of the knife. The angle of the blade of the three knives was No. 1=16°; No. 2=16°; No. 3=13°; and the cutting angle ground on the edge of the blades was: No. 1=40° No. 2=36°; No. 3=35° (see Figs. 5, 6, and 7).

FIG. 5.



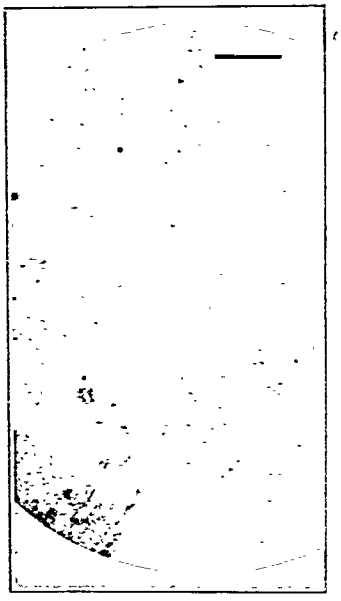
Knife No. 1.

FIG. 6.



Knife No. 2.

FIG. 7.



Knife No. 3.

FIGS. 5, 6, and 7 (× 100).—The blade-angles of stainless steel knives 1, 2, and 3 respectively. The distinctions between the angles of the blades, 16°, 16°, and 13° respectively, and the cutting angles, 40°, 36°, and 35°, are well seen.

FIG. 8.

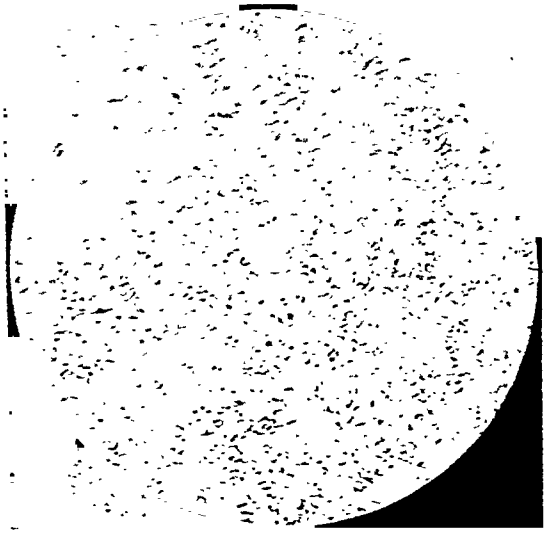


FIG. 8.—A photograph showing the microstructure (× 500) of one of the blades, which is typical of all three. The uniformity of the "pearlite" of stainless steel is evident.

Dr. Hatfield says that "one can rely upon retaining a hardness of 550 to 575 Brinell in stainless steel knives, and such knives are capable of keeping their edge when cutting through soft tissues of various kinds." If they encountered bone the edge might be expected to turn; and there is no doubt that such an encounter by an ordinary carbon-steel surgical knife hardened to 630–650 Brinell would also prove to the disadvantage of the knife.

After due trial it appears that the employment of blades of stainless steel is warranted for surgical and dental procedures, because such a course will mean a great economy of time and labour in cleaning and polishing instruments, and re-nickelling will be completely avoided. Stainless steel, suitably tempered, will also prove useful for similar reasons when employed for splints and in the manufacture of orthopædic apparatus.

THE ROYAL ALBERT INSTITUTION.

THE Royal Albert Institution for the Feeble-Minded held its twelfth quinquennial festival on Oct. 5th. The foundation-stone was laid in 1868 and the first patients were received in 1870. Since then 4407 patients have passed through the institution, and four out of every five have shown improvement, 10 per cent. becoming practically self-supporting. Of the 75 applicants for admission this year no fewer than 40 had lost one or both parents. Sir Robert Armstrong-Jones delivered the address at the Festival, and urged the pressing national importance of the care of the feeble-minded, lauding the devotion and altruism of those who devoted their lives to this service. The problem, he said, concerned the educationist, the socialist, and the sociologist; it was of urgent importance for welfare workers, for economists, and for statesmen. No illness could cause more distress and anxiety or cast such a shadow over a family. The origin of homes for mental defectives in this country was a series of articles which appeared in Chambers' Edinburgh Journal in 1847. They were written by Dr. Samuel Gaskell, subsequently a Commissioner in Lunacy, and described the work of Seguin at the Bicêtre, in Paris. As a result Dr. Andrew Reed had founded and opened Park House, Highgate, which had been the predecessor of Essex Hall, Colchester, now the Royal Eastern Counties Institution. This, in turn, had been the parent of the Royal Earlswood Institution, of which the Royal Albert was the daughter. Dr. Reed's foresight, wisdom, and enthusiasm had kindled a like zeal in great citizens of the north, and in the Royal Albert Institution the untaught, the undisciplined, and the uncared-for had been educated and trained to be helpful to themselves and useful to others. Tact, skill, and kindness had transformed the sullen, and coercion was unknown. The exhibition showed the extraordinary amount and variety of useful work which could be accomplished in an organised school of training, and also illustrated the high standard of industry attainable by patients who would otherwise lead idle lives, a source of trouble to their relatives, and of danger to the community.

The Royal Albert Institution has shown what can be done; the recent report of the Board of Control shows in vivid contrast what yet remains to be done. The country needs to be reminded of the codicil of Dr. Reed's will, which hangs in the entrance hall at Earlswood: "I bequeath the Four Asylums," he wrote, "to my beloved country, with an earnest prayer that they may be watched over with wisdom and benevolence—that they may be kept free from abuse, preserved in efficiency, and remain age after age Memorials of the Divine Charity which exalteth and glorifieth a People."

A HANDBOOK ON HANGING.

WHETHER or not there is justification for the death penalty in a modern civilised state is a matter of opinion. But there can be no two opinions that capital punishment should only be permitted as a deliberate policy; it is inexcusable if it is allowed to survive merely because of public inertia. Fortunately there is no doubt that the sense of individual responsibility for the behaviour of the State is becoming more common year by year, and the relationship of the State to the criminal, or the anti-social individual, is becoming a matter for earnest consideration among an increasing number of citizens.

The object of Mr. Charles Duff's satire, A Handbook on Hanging (Cayme Press), is no doubt to aid the propaganda for the abolition of capital punishment, and to some extent it succeeds. It certainly brings home the fact that an execution is a very dreadful affair for which each individual citizen is as responsible as if he had actually assumed the hangman's duties. At times the propagandist triumphs over the satirist—and it may be doubted whether wit, however bitter, is the medium of choice for dealing with this subject.

NATIONAL INSTITUTE FOR THE BLIND.

THIS year's annual report of the National Institute for the Blind (224, Great Portland-street, W. 1) is an encouraging account of its activities, illustrated by a remarkable series of photographs which help the reader to realise how much can be effected for blind children and adults by education, and especially by education of their hands.

The objects of the Institute are two: first to promote in every possible way the welfare of the blind from birth to old age, and secondly to coördinate national and local work so that the maximal amount of good is secured to the blind population of this country as a whole from all national and local bodies working on their behalf. In the former connexion are included the publication of embossed books, periodicals, and music; the preparation of Braille copies of text-books for blind students and the formation of a students' library, the maintenance of sunshine homes for blind babies, a college for blind girls, homes and hostels for blind women and students, the promotion of home industries and home workers and placing of the blind in industrial concerns, and the provision of all wireless facilities The coördination of national and local work is being furthered by unification of collation schemes, agreements for which have now been entered into with 67 local agencies for the blind in different parts of the country. These schemes, approved by the Ministry of Health, need to be applied for several years before their financial possibilities can be judged, but already, we are told, goodwill between the national and local bodies has been immensely fostered by them.

Included in the report is an interesting article on the Blind and Personal Service. There is a regrettable tendency to treat the blind as if their affliction carried with it some mental handicap, but this is by no means necessarily the case. As the writer remarks: "Who dare affirm from personal knowledge that the average blind man or woman of to-day with a knowledge of Braille is one whit behind in intelligence the average man or woman with sight who knows how to read?"

STERILISATION OF THE INSANE IN SWITZERLAND.

ON Sept. 3rd the following clause was added by the Grand Conseil of the Canton of Vaud, Switzerland, to the Cantonal Act regarding the insane:—

Art. 28 bis. Une personne atteinte de maladie mentale ou d'une infirmité mentale peut être l'objet de mesures d'ordre médical pour empêcher la survenance d'enfants, si elle est reconnue incurable et si, selon toutes prévisions, elle ne peut avoir qu'une descendance tarée.

L'intervention médicale n'a lieu que sur autorisation du conseil de santé.

Le conseil de santé lui-même ne donne cette autorisation qu'après enquête et sur préavis conforme de deux médecins désignés par lui.

Il décide de l'attribution des frais.

"THE IMPOTENCE OF MAN."

SCIENCE is sometimes reproached with being antagonistic to religion, and the first few chapters of Prof. Richet's book[1] may give colour to this complaint. Starting on a somewhat pessimistic note, he shows that man is trammelled by his environment; that, save in thought, gravity is our gaoler; and that the whole human race is but an imperceptible atom in the immense universe, while each human person is an insignificant fragment of the tiny human race. But we shall only have the right to bewail our lot, he says, when we reach the boundaries of knowledge, and these are still a long way off. Following this train of thought he deals in successive chapters with the impotence of the individual, impotence and happiness, intellectual impotence, physiological impotence (not, of course, in the technical sense), and moral impotence, his seeming pessimism giving place to optimism as he shows how the ego can rise superior to environment, and he works out a philosophy of life which may be summed up in the injunction, "Know thyself." The chapter on Moral Impotence is an analysis of human nature and its motives, and a plea for the mastery of self. "The more our personality is overwhelmed by cosmic, physiological, and social forces, the more it should strive to keep its sovereignty in its own little kingdom. There it rules alone." Indifference to small worries he holds to be a primordial virtue without which there is no true happiness, and he closes his book with the words, "And let us strive to make a little happiness round us, for happiness sends out beams like light, and whatever fools and knaves may say, our happiness depends on that of others."

The book is one which provides much food for thought.

[1] The Impotence of Man ("L'Homme Impuissant"). By Charles Richet, Professor of Physiology at the Faculté de Médecine, Paris. Nobel Prize for Physiology, 1913. Translated by Lloyd Harvey. London: T. Werner Laurie, Ltd. Pp. 150. 7s. 6d.

Harveian Oration

ON

CARDIOVASCULAR DISEASES SINCE HARVEY'S DISCOVERY.

Delivered before the Royal College of Physicians of London on Oct. 18th, 1928,

BY SIR HUMPHRY ROLLESTON, BART., K.C.B., M.D. CAMB., HON. D.SC., D.C.L., LL.D.,

FELLOW AND SOMETIME PRESIDENT OF THE COLLEGE; PHYSICIAN IN ORDINARY TO THE KING; REGIUS PROFESSOR OF PHYSIC IN THE UNIVERSITY OF CAMBRIDGE.

THE President's command to deliver the 272nd Harveian oration in the tercentenary year of the publication of the "Exercitatio Anatomica de Motu Cordis et Sanguinis in Animalibus" is an honour to be prized with humble gratitude, but with a due sense of its heavy responsibility, by any man, especially by one whose father obeyed the call to this high duty 55 years ago.

The tercentenary of the publication of Harvey's immortal discovery was appropriately and splendidly commemorated by the celebrations organised by this College. In no way could its significance have been more suitably and graphically shown than by the remarkable cinematograph films of Harvey's original physiological experiments as repeated by Sir Thomas Lewis and Dr. H. H. Dale, Fellows of the College, who have been eminent in obedience to Harvey's exhortation "to search and study out the secrets of nature by way of experiment." Further, the historical aspect of the tercentenary has been permanently marked in the production of a facsimile of the first edition of the "De Motu Cordis" by the College, and by the appearance of two other Harveian books, a reproduction of the first English translation in 1653 of the "De Motu Cordis" (Nonesuch Press), and "A Bibliography of the Writings of William Harvey, M.D." (Cambridge University Press), both due to the pious devotion of a licentiate of the College, Mr. Geoffrey Keynes.

John Freind (1675–1728), the elegant scholar and eminent physician, when commenting on the history of the circulation, wrote in 1725:

> "From this discovery of our great countryman (Harvey) many improvements even in the cure of distempers, might be made; he had thoughts of composing such a work himself, to show the advantages of this doctrine, in relation to practice, but was prevented by sickness and death; the design of the Architect was very noble, and I with some of his successors might finish it. At present I shall hint only at two or three particulars, which will convince us, of what use a perfect knowledge of the circulation may be to us, if rightly applied, in the practical part of our profession."

If more than two centuries ago the learned author of "The History of Physick from the Time of Galen to the beginning of the XVI. Century" apparently thought the task difficult and accordingly acted with wise discretion, it is now obviously, from limitations of both time and capacity, impossible to attempt more than the barest outline of the accumulated knowledge of the diseases of the circulatory system since Harvey's time. An attempt to piece together the history of the various forms of cardiac disease is attended by no small difficulties; the same idea may occur to several minds at the same time, but simultaneous and identical solutions may not be published synchronously, thus making it far from easy to decide who really deserves the rather barren crown of priority. Another obvious objection to such a subject is that it entails lists of men and dates; but as many of these names are those of Fellows of this College it will surely be in obedience to Harvey's injunction to commemorate these benefactors of the College, for can any benefaction be more welcome than new and true knowledge?

The knowledge of cardiovascular disease which was very slight at the time of the discovery of the circulation has since come through several channels: (1) the accumulation of data provided by anatomical observation, normal and morbid; (2) unaided clinical observation; (3) as the result of the application of instruments of precision to the examination of patients; and (4) the information derived from physiological and pathological experiments. Though these four headings are attractive as a means of sketching the advance of knowledge, it is in practice difficult, and indeed somewhat inconvenient, to follow them out rigidly or attempt to make them absolutely watertight; there will therefore be much overlapping, as will at once be only too obvious.

I. ANATOMICAL OBSERVATION.

Anatomy is an indispensable step to the more complex science of physiology which explains the vital forces of the body, and this, though it may be helped by anatomy, demands observation of or experiment on the living organism. Frabricius's description of the valves in the veins stimulated Harvey to find out their use by the experimental method. Gaskell's physiological demonstration of the muscular continuity between the auricle and the ventricle was made on reptiles and was supposed to be confined to them until 1893, when the auriculo-ventricular bundle was described in mammals by Stanley Kent and by W. His, junior; in 1906 Tawara gave a full account of the junctional system, including the auriculo-ventricular node and the bundle previously described by Kent and His, the fibres of the bundle being continued into the Purkinje fibres which line the interior of the ventricles and communicate with their muscular fibres; this was followed in 1907 by Keith and Flack's discovery of the sino-auricular node, the normal pacemaker of the mammalian heart; the later anatomical observations were subsequent to and directly stimulated by the needs of the new cardiology, for Mackenzie's epoch-making book on the pulse was published in 1902. Thus it may be noted that, just as medicine is deeply indebted to the experimental method, so also science owes a debt to medicine, and that they two "according well may make one music as before."

The Capillaries.

The tercentenary of the birth of Marcello Malpighi, the father of histology, on March 10th, 1628, and that of the "De Motu" appropriately coincide, for in 1661 he provided the final proof of Harvey's discovery by recognising the capillaries in the frog's lung. He also saw the red blood corpuscles in the mesenteric vessels of a hedgehog, but as he regarded them as fat cells, Antony van Leeuwenhoek, who described them fully in his "True Circulation of the Blood" in 1686, has the credit of their recognition. Johannes Swammerdam, however, had actually noted the presence of red blood cells as early as 1658, but his observation was not made public until 1738, when Boerhaave brought out Swammerdam's "Biblia Naturæ."

After the discovery of the capillaries there was a long interval before this most essential part of the circulatory system received due attention. Thomas Young in 1808 had the foresight to assume as probable variation in the size of the capillaries. The view that the capillary circulation was a mere passive communication between the arterioles and the venules was definitely modified by Stricker's observation in 1865 that the capillaries became constricted from swelling of the endothelial cells. In 1873 Rouget observed on the surface of capillaries the cells which bear his name, and described their contraction. In 1879 Roy and Graham Brown showed that the calibre of the capillaries is constantly changing without corresponding alterations in the arteriolar pressure. The study of the capillary circulation then languished; but the invention of capillary microscopy by Lombard in 1912 again stimulated investigation, and it has now been proved that the walls of the capillaries have independent powers of changing their calibre.

The capillary circulation, thanks to the experimental labours of Dale, Laidlaw, Richards, Krogh, and Lewis,

has been placed in a new light. It appears that the capillary area as a whole is in a constant state of flux; while the greater portion is relatively empty, various parts of it open for a time, so that with a continually changing condition of the constituent portions the average total path remains about the same and maintains the peripheral resistance. Normally only a very small proportion of the whole available capillary area is open, for if it were universally open all the blood would stagnate there. The varying dilatation of the capillaries corresponds, as Krogh demonstrated in muscle, with the needs for it.

Morbid anatomy must also be supplemented by clinical observation or by experiment; the example set by Harvey of always submitting to the test of physiological proof the explanations suggested by anatomy, which is completely instructive only when elucidated by physiological experiment, was followed with regard to morbid anatomy and its correlation with symptoms by Morgagni, Corvisart, Laennec, Hope, and later the experimental results obtained by Claude Bernard, Cohnheim, Roy, Starling, and many others were brought to supplement the teaching of the post-mortem room.

It was not until the eighteenth century, with the publication of observations on morbid anatomy made by Raymond Vieussens (1715), Lancisi (1718, 1740), and Morgagni (1761), and the first treatise dealing specially with diseases of the heart by J. B. de Senac (1749), that cardiac disease was really recognised. Theophilus Bonetus (1620–89), in the first volume of his "Sepulchretum" (1679), collected a number of observations on palpitation and cardiac pain during life associated with polypi in the heart, calculi in the myocardium, inflammation of the heart, acute inflammation, effusion and adhesion of the pericardium, and aortic aneurysm, and thus prepared the way for Morgagni and others. Vieussens and Morgagni recorded a number of valvular lesions, and Lancisi in 1718 described vegetations on the valves and noted dilatation and hypertrophy, but applied the term aneurysm to the former; in his posthumous book (1740) syphilitic lesions of the heart were outlined. De Senac described ulceration, abscess, and inflammation of the heart, "the hairy heart" of acute pericarditis, and in a short chapter malformations.

Corvisart and his pupils, Laënnec and Bouillaud, carried on the anatomico-clinical investigation of cardiac affections, and among the Fellows of this College James Hope (1801–41) set a fine example in this respect.

II. Unaided Clinical Observation.

Under the heading of unaided clinical observation the use of the stethoscope may perhaps be included, as it is artificial to separate the employment of this instrument of precision from that of direct auscultation. In this section the history also is outlined of some cardiac disorders—dyspnœa, angina pectoris, coronary thrombosis, the Stokes-Adams syndrome—which give rise to characteristic clinical pictures. As would naturally be anticipated, the history of cardiac diagnosis shows that in the main recognition and correlation of symptoms came first and the invention of physical methods of examination later. Albertini (1672–1733) of Bologna laid stress on palpitation and dyspnœa as evidence of cardiac disease, and ascribed the latter to venous stasis in the lungs. He also made use of palpation, which was little employed before his time or indeed for a hundred years after, until Corvisart revived it and drew attention to thrills.

Percussion.

Percussion was described by Leopold Auenbrugger (1722–1809) of Vienna in a pamphlet of 22 pages in 1761, the year in which Morgagni's great work on morbid anatomy, "De Sedibus et Causis Morborum," appeared, and so should have been a means of correlating physical signs with gross structural changes. But though praised as worthy of all attention by his senior contemporary, Albrecht von Haller of Berne, and translated into French by Rozière de la Chassagne and published in Paris in 1770, the conservatism responsible for opposition to Harvey discovery delayed the acceptance of Auenbrugger percussion. It was thus long before its time, an did not receive any recognition until in 1808, th year before the author's death, J. N. Corvisa translated it into French for the second time.

Auscultation.

Auscultation, though in practice and in our mind dating from Laënnec and the invention of the stetho scope, was not an absolutely new idea in 1819.

The story of the invention of the stethoscope b René Théophile Hyacinthe Laënnec (1781–1826) ha often been told: in 1816 he noticed boys in a Cou of the Louvre at play with the ear applied to lon pieces of wood listening to the transmitted sound a pin scratch at the opposite end. He immediatel put this hint into practice, as he says, by applyin a rolled up quire of paper to the chest of a stout gi with symptoms of heart disease, and was electrifie by finding that the heart sounds were more audib than to the direct ear. He keenly practised th method at the Necker Hospital, where, howeve Granville, as an onlooker on Sept. 16th, 1816, stat that the original birth of mediate auscultation actuall occurred on the chest of a male patient. Laënn then devised a wooden cylinder one and a half inch in diameter, a foot long, and perforated longitudin ally by a bore three lines wide; this he regarded too simple to require a name other than "th cylinder" or "bâton"; but eventually, as somewha barbarous names, such as sonometra, pectorilogu thoraciscope, cornet de papier, and cornet médica appeared on the horizon, he suggested, if it mus have a name, stethoscope. With his knowledge o morbid anatomy he correlated the local lesions wit the corresponding physical signs, like his teache Corvisart, thus advancing the anatomico-clinic method and the special pathology of the organs in the extraordinary short time of three years, s that his classical work, "Ausculation médiate, appeared about August 15th, 1819. While correctin the proofs he had been busily making stethoscopes s that every buyer of his book might be properl equipped; in fact, it is probable that at the time o his death every existing stethoscope was the wor of his hand (Thayer).

Though the stethoscope has some obvious advan tages over the naked ear, the enormous advances tha followed its introduction were not so much due t the stethoscope as a mechanical instrument as to th psychological effect that this new method exerte on Laënnec, who otherwise would not have so ardentl pursued auscultation as a means of diagnosis. I was much the same with regard to the pleximete introduced by P. A. Piorry (1794–1879) ("Traité d la percussion médiate" dedicated "Aux mâne d'Auenbrugger, de Corvisart, et de Laënnec") i 1828, which in itself, apart from its temporar influence in stimulating investigation, is inferior a a method of elicitating physical signs to Auenbrugger direct percussion which it was intended to supersede

Laënnec's original stethoscope underwent modifi cations by him, Piorry who reduced the thicknes of the stem to that of the finger, C. J. B. Williams and others. The invention of the binaural was th subject of some dispute as to priority, as is shown i the pages of the *London Medical Gazette* for 1840–41 Sibson used one in 1838, Burne in 1840, and Goldin Bird stated that Babington at Guy's had used on for some time. In America, where it was introduce in 1850 by Cammann, its vogue became general muc earlier than in this country. Auscultatory percus sion, or a combination of the two methods enablin the vibrations produced by percussion to be directl transmitted to the ear by the stethoscope, wa advocated by Cammann and Clark in 1840. Mor modern developments are the phonendoscope an differential stethoscope.

Until auscultation had become somewhat elabo rated the diagnosis of heart disease depended o general symptoms, such as dyspnœa, palpitation

a weak and irregular pulse, and there was not any discrimination in diagnosis. In the posthumous edition of Matthew Baillie's "Morbid Anatomy" (1825) it is stated that "no observations have yet been made by which practitioners can ascertain with any precision what set of valves is diseased." But Laënnec's "Auscultation médiate" (1819) stirred the waters to much purpose. Bouillaud, Hope, Williams, and Elliotson became extremely active in tabulating the physical signs with the valvular lesions and accumulating data — the time, propagation, and characters—so as to determine the significance of murmurs. Hope's "Treatise on Diseases of the Heart and Great Vessels," 1832 (3rd ed., 1839), though somewhat marred by his disputes with Bouillaud, chronicled a most notable advance; having carried on experimental research, he was able to apply physiological principles to unravelling the hæmodynamic problems of cardiac disease.

During the latter half of the last century an exaggerated importance was attached to cardiac, and especially systolic, murmurs as evidence of heart disease. With "the passing of morbid anatomy," or the overshadowing of gross morbid changes by the renewed attention to symptoms and physiological efficiency, there has now resulted a diminution in the importance attached to the physical signs of cardiac disease. But the traditional stress laid on the presence or absence of a murmur as the criteria in determining whether the heart was or was not seriously affected, though qualified by the warnings of W. T. Gairdner (1862), Thomas Watson, Andrew Clark, G. W. Balfour, and others, did not become fully discounted until after the war, and then largely by Mackenzie's insistence.

Cardiac Dyspnœa.

As a result of work done during and since the war, cardiac dyspnœa may be divided into (1) simple in which there is increased irritability of the respiratory centre from oxygen want brought about by diminished blood-supply to the centre; in these cases, occurring in the young, especially with mitral stenosis, and comparatively early, the cyanosis being bright, Fraser, Ross, and Dreyer found a definite alkalæmia, and Lewis and Barcroft noted the absence of acidæmia; (2) cases of a more complicated nature, often arteriosclerotic or cardiorenal, in older people, with myocardial degeneration, dyspnœa occurring later, and the cyanosis being of a leaden hue (Fraser). In these cases there is acidæmia (Lewis and Barcroft) and stimulation of the respiratory centre by the increased hydrogen-ion concentration, the fundamental idea that acidæmia causes breathlessness being directly deducible from Haldane and Priestley's work (1905). These cases manifest true cardiac asthma with a sudden onset which was ascribed by Lewis, Ryffel, Wolf, Cotton, and Barcroft (1913–14) to sudden waves of acidæmia. The attacks are probably much allied to those long known as renal asthma which, as pointed out by Loomis (1873) and Stephen Mackenzie (1889), are greatly benefited by hypodermic injection of morphine. These paroxysmal attacks of cardiac asthma were mentioned by Heberden, who eliminated from his picture of angina pectoris the symptoms of breathlessness; but there is a close relation between the three conditions of angina pectoris, œdema of the lung, and cardiac asthma (Pratt), which may be combined or confused with each other. Hope in 1839 gave an account of cardiac asthma, but rather confused the issue by bringing in ordinary cardiac dyspnœa and Cheyne-Stokes respiration. Clinically James Mackenzie drew special attention to the true cardiac asthma about which scepticism had been expressed. The value of morphine hypodermically in the paroxysmal dyspnœa of cardiac asthma has recently been emphasised (Fraser), and it may be noted that on more general grounds Clifford Allbutt in 1869 recommended morphine in cardiac disease by the then comparatively new method of hypodermic injection, the syringe having been invented by F. Rynd in 1845, and by Alexander Wood in 1855.

Angina Pectoris.

Angina pectoris was first described on a good basis of cases, 20 in number, by the British Celsus, William Heberden the elder (1710–1801), in a paper entitled "Some Account of a Disorder of the Breast" read before this College on July 21st, 1768. In the text he says: "The seat of it, and sense of strangling and anxiety with which it is attended, may make it not improperly called angina pectoris," and his posthumous "Commentarii de Morborum Historia et Curatione," 1802, p. 308, show that altogether he had seen 100 cases. Isolated cases had been reported before this. Seneca in his epistles to Lucilius recorded his own sufferings, which may well have been those of angina sine dolore, and at any rate were by his medical attendants called a "Meditatio mortis," the Earl of Clarendon described the sudden death of his father Henry Hyde in 1632, and Morgagni the case of a woman who died in 1707 with a characteristic distribution of the pain and was found to have a dilated and calcified aorta. Hoffmann recorded another single case "de spasmo præcordiali a motu corporis" in 1734; Rougnon, professor of medicine in the University of Besançon, wrote a letter to M. Lorry dated Feb. 23rd, 1768, a copy of which is in the library of the Surgeon-General of the U.S. Army (Osler), earlier in the same year as Heberden's more complete account, describing a case of angina with a necropsy, and accordingly in France a claim for priority was made for him by Huchard. On Nov. 17th, 1772, two further communications on the subject were made to the College; Heberden read a letter addressed to him by a man signing himself "Unknown," who, having seen an abstract of Heberden's original paper in *The Critical Review*, recognised the resemblance to his own experiences, gave an account of them, considered by Osler as one of the best extant, and expressed a wish that in the event of his death there should be a necropsy; this, when performed by John Hunter, did not reveal anything save slight calcification of the aorta, but Edward Jenner, who was present, wrote to Caleb Hillier Parry, "I can almost positively say the coronary arteries of the heart were not examined." The other, though less dramatic, communication made at this meeting, by John Wall (1708–76) of Worcester, has perhaps hardly received its due mead of attention; for in his letter to Heberden describing the post-mortem examination of a case of aortic stenosis with angina, the first inch of the aorta is stated to have been partly ossified, and the spasm of the pectoral muscle is ascribed to "an irritation on the nerves of the thorax and heart," and the following comment is added: "Perhaps it may throw some light on this affair to consider that the nervi intercostales or sympathetici distribute many branches to the heart, arteria pulmonalis, and aorta." He thus perhaps in the first place anticipated James Mackenzie's view that the pain of angina is partly due to spasm of the intercostal muscles and Charlton Briscoe's suggestion that the spread of pain depends upon irritation of one of the expiratory muscles, and in the second place suggested Corrigan's and Clifford Allbutt's conception of the aortic origin of anginoid pain. The association of coronary disease with angina was first recognised by Edward Jenner from post-mortem examination, though it is possible that John Hunter, on whose account, as his anginal symptoms dated from 1773, Jenner kept silence, knew or suspected it in 1776 when John Fothergill published a fatal case of angina in which at the post-mortem Hunter found that "the two coronary arteries from origin to many of their ramifications on the heart were become one piece of bone." Jenner, who is said to have diagnosed angina in Hunter in 1777 (vide Palmer), never directly published anything on this subject, but he communicated his opinions to C. H. Parry, who in 1788 read a paper, "An Inquiry into the Symptoms and Causes of the Syncope Anginosa, commonly called Angina Pectoris; illustrated by Dissections," to a small medical society in Gloucestershire of which Jenner was a member, and came to the

conclusion that coronary disease was the cause. In this paper, not published until 11 years later, he quoted the case of ossification of the coronary arteries published by Black of Newry in 1795, and pointed out that he and Jenner had independently come to the same opinion in 1788.

The explanation of the causation of angina pectoris by coronary disease was, as pointed out by Osler, given by Allan Burns (1781–1813), the Glasgow anatomist and surgeon, who in 1809 ascribed the symptoms to anæmia, or as it might now be expressed anoxæmia, of the heart muscle resulting from coronary obstruction. This conception is now known as intermittent claudication—a term introduced by Bouley in 1831 in regard to horses and applied to man by Charcot in 1858—and perhaps more intelligibly as intermittent limp (Erb). Benjamin Brodie in 1846 explained angina pectoris on these lines rather more fully, and Potain in 1870 expressed the same opinion. The view that disease of the base of the aorta was one of the causes of angina pectoris, perhaps dimly foreshadowed by Wall (1772) and Baumes of Montpellier (1808), was put forward by Dominic Corrigan (1802–80) in 1837, and by Clifford Allbutt from 1894, with confirmation from our Honorary Fellow, K. F. Wenckebach, in the special lecture he gave in this library on May 5th, 1924, when he accordingly advocated division of the depressor nerve. James Mackenzie considered that angina is due to cardiac failure, a revival of the view held by Parry (1799) and supported by Stokes (1854), and Daniélopolu put forward the slightly different explanation that myocardial intoxication by fatigue products is responsible for angina.

The syndrome of angina pectoris, ascribed to various factors, has been divided into (1) true, organic or major, and (2) functional, pseudo, mock, false, vasomotorial or minor. John Latham (1813) described a spurious form as angina notha; Laënnec (1818), who had two attacks, did not accept coronary disease as the cause, considered mild cases as common, and described it as neuralgia of the heart; Desportes (1813) had previously expressed a similar view; Forbes, the translator of Laënnec's "Auscultation médiate," spoke of organic and of functional angina, subdividing these two main categories. Lartigue (1846) and Walshe independently introduced the term "pseudo-angina," which has not escaped criticism from Allbutt and Mackenzie; Nothnagel in 1867 brought in the term vasomotor angina; and toxic angina, especially that due to tobacco, was described by Huchard. Angina sine dolore, a form of true or major angina, was so named by W. T. Gairdner (1877). The distribution of pain and cutaneous tenderness was investigated by James Mackenzie (1892) and Henry Head.

Excision of the cervico-thoracic sympathetic containing the sensory nerves of the heart and aorta as a means of relieving the pain of angina was suggested in 1899 by François-Franck, the physiologist, but not put into practice until 1916 by Jonnesco of Bucarest. The treatment by amyl nitrite was initiated in 1867 by Lauder Brunton (1844–1916), when a house physician, on the grounds that he found the blood pressure high in an attack and, having heard from Arthur Gamgee that amyl nitrite lowered the blood pressure, logically and successfully employed this drug.

In the tercentenary year of the publication of the "De Motu Cordis" it is interesting to find that the coronary circulation, on which R. Lower, R. Vieussens (1706, 1715), and Adam Christian Thebesius (1708) worked, has been investigated after the Harveian manner. Wearn finds that the blood in the coronary arteries may pass into the Thebesian vessels and so into the ventricles or auricles without entering the capillaries, there being either a direct communication between the coronary arteries and the Thebesian veins, or more probably between the arteries and large veins, and thence into the cavities of the heart. Further, he argues from observations on two cases of gradual complete obliteration of the orifices of both coronary arteries that the Thebesian vessel may take on the new function of supplying the heart muscle with blood from the cavities of the heart, a view to some extent previously expressed by Pratt. The coronary blood flow depends on the arterial pressure, but opinions differ as to the relative importance of the diastolic and systolic blood pressures in the aorta. In this year Anrep and King have shown by experiment that the coronary blood flow is not determined by either the diastolic or the systolic pressures in the aorta singly, but follows closely changes in the arithmetical average of the diastolic and systolic aortic pressures, which in most cases is a sufficiently accurate measure of the true mean pressure.

Coronary Thrombosis.

The syndrome of thrombosis of the coronary arteries, long included in angina, has quite recently been isolated, though Harvey's description of Sir Robert Darcy's case, in his second Disquisition to J. Riolan, in which the wall of the left ventricle was ruptured apparently as the result of "an impediment to the passage of the blood from the left ventricle into the arteries," has now been recognised as an early example (Wearn). The syndrome, first described in 1910 by Obrastzow and Strachesko and again in 1912 by J. B. Herrick, is, now that its characteristic features have been pointed out, obviously a frequent event; this year Parkinson and Bedford published 100 clinical cases, and, in addition, 83 post-mortem cases. Isolated cases had been reported in 1884 by Leyden and even diagnosed by Hammer in 1878, and it is now easy to wonder why coronary occlusion, long recognised pathologically, had not been correlated earlier with a clinical picture. Cases of angina with pericarditis had been recorded (Steell), and the occurrence of the status anginosus, or pain lasting for hours or days in contrast to the pain of angina, which is a matter of minutes, was noted by Huchard. Both these phenomena belong to the syndrome of coronary thrombosis. Rapid and sudden death may be due to ventricular fibrillation or to rupture of the infarcted area as in Harvey's case; recovery may occur, but myocardial failure, cardiac aneurysm, rupture, or recurrent thrombosis may follow.

Stokes-Adams Syndrome.

J. B. Morgagni in 1761 mentioned two men aged 68 and 64 years with slow pulse-rates, one "22 within one-sixtieth part of an hour," dating from the time they were "first attacked with epileptic paroxysms, beginning from the belly"; Heberden in 1768 described a pulse seldom above 30 associated with torpidity; Andrew Duncan described the same events in 1793; Bright in 1831 recorded the clinical features of a case with a necropsy showing a much enlarged heart. The condition was called maladie de Stokes-Adams by Huchard after the two Irish physicians, Robert Adams and William Stokes, who gave accounts of it in 1827 and 1846 respectively and laid much stress on fatty degeneration of the myocardium; indeed, they transferred to that condition many of the symptoms of complete heart-block. This, of course, was long before Gaskell's physiological explanation (1883) of heart-block which is usually, but not invariably, primarily responsible for the syndrome. Galabin in 1875 first published tracings of the independent contractions of the auricles and ventricles, and ten years later Chauveau's tracings also showed this in a man with an auricular rate of 60 to 65, and a ventricular rate of 21 to 24. Osler pointed out the various forms of the Stokes-Adams syndrome, especially the rare cases with gross extrinsic lesions exerting pressure on the medulla or the vagus, such as those of Holberton, Lépine, and Boffard, and to his writings the general recognition of the syndrome is due in no small degree. Recently it has been shown that the ventricle may pass into fibrillation, and that the direct injection of adrenalin into the heart will start the circulation again even if it has stopped for four or five minutes. Subcutaneous injection of adrenalin has been found to arrest the syncopal

attacks (Phear and Parkinson) but not to prevent them. For this purpose Cohn and Levine had recourse to barium chloride by the mouth, which, by increasing the irritability of the ventricle, was successful in preventing the attacks. An interesting account of his own experiences during the last seven years of his life was given by W. T. Gairdner (1824–1907).

III. Instruments of Precision.

Sphygmomanometry.

The history of blood pressure really begins with Stephen Hales (1677–1761), minister of Teddington, who with a sound training in Newtonian physics applied this knowledge to biology and physiology. Before 1723 he tied tubes into the arteries and veins of animals and estimated the pressure in the capillaries, thus being far in advance of his time. In a mare he found that the blood pressure was equal to a column of blood of eight to nine feet. Nearly a century passed before the subject was further investigated, and then Poiseuille (1828) employed a U-shaped mercurial manometer (hæmodynometer).

The clinical estimation of blood pressure by instrumental means was first attempted by Vierordt in 1855 by measuring the weight necessary to stop the arterial pulsation; but von Basch invented a sphygmomanometer on this principle which was applied locally over an artery and was widely used. This underwent modifications, among others by Potain (1889), Marey, Mosso, and Hürthle. Attention should be drawn to F. A. Mahomed's laborious observations on blood pressure made between 1874 and 1881, not with a sphygmomanometer, but with his own form of Marey's sphygmograph, which led him to anticipate much that is now known and far more easily verified; for example, he described a pre-albuminuric rise of blood pressure in Bright's disease, which with von Basch's conception of "latent arterio-sclerosis" and Huchard's pre-sclerosis led up to the recognition of primary or essential high blood pressure or hyperpiesia. The present sphygmomanometric methods became generally available as a result of Riva-Rocci's modification of von Basch's instrument. The publication of Korotkoff's auditory or auscultatory method in 1905 has made estimation of the diastolic pressure both easy and accurate for all conditions except some cases of aortic regurgitation.

The general use of the sphygmomanometer in this country was largely due to Clifford Allbutt, Brunton, and G. Oliver. The greater stability of the diastolic than of the systolic pressure, and therefore its greater diagnostic value, the importance of the pulse or differential pressure, and a correct estimation of the significance of abnormal pressures have gradually become stabilised. Clifford Allbutt described the occurrence of high blood pressure without renal disease, and introduced for this the word hyperpiesia. He also insisted that long-continued high blood pressure may cause, but is not due to, arteriosclerosis.

Estimation of the venous pressure and of the capillary blood pressure has naturally followed.

The Sphygmograph.

The sphygmograph, first invented by K. Vierordt in 1855, and improved by Marie (1860), who did so much to popularise the method of graphic registration, Mahomed (1872), Burdon-Sanderson (1867), R. E. Dudgeon (1882), Pond, von Jacquet, and others, was much used; though the information it provided was somewhat limited, it was the first step in the application to cardiology of the graphic method of record, which has since thrown so much light on hæmodynamics. By means of his clinical polygraph (1902) James Mackenzie, then of Burnley, correlated the arterial and venous pulses with those of the heart, and thus brought order out of the chaos of cardiac irregularities, distinguishing the unimportant, such as the extrasystoles of sinus arrhythmia, from those, such as pulsus alternans, pathognomonic of grave organic disease of the heart muscle.

The Electrocardiograph.

The potential bearings of investigating the electric currents produced by the cardiac contractions, recognised in 1843 by Matteuci of Pisa, and in 1856 by Kölliker and Müller, were examined with the capillary electrometer by Sanderson and Page (1878), Gaskell (1881), Starling and Bayliss (1890), and A. D. Waller. In 1903 Willem Einthoven (1860–1927), of Leyden, first described the string galvanometer which was a great advance on the capillary and other galvanometers, and utilising Waller's observation that curves of the cardiac contractions can be obtained from the limbs of animals without opening the chest, he, as Sir Thomas Lewis says, laid the foundation of human and experimental electrocardiography, and by papers published in 1907 and 1908 led to modern electrocardiography and the final analysis of the arrhythmias. The fundamental knowledge thus acquired by methods demanding delicate instruments it has fortunately been possible to correlate in many instances with simple indications which can be employed at the bedside. Wenckebach, Thomas Lewis, and their followers have thus exactly localised the site of disorders and morbid changes in different parts of the heart muscle, and particularly in the junctional system, such as lesions of the right or left branch of the auriculo-ventricular bundle, and the Purkinje aborisations, thus providing evidence of myocardial degeneration and impending cardiac failure earlier than can be detected by other means of examination.

Auricular Flutter.

Auricular flutter was described as long ago as 1887 by MacWilliam as the result of weak faradisation of the mammalian auricles. Clinically, however, it was not recognised until much later by W. T. Ritchie and by Hertz and Goodhart. A healthy auricle responds to a single stimulus by a single contraction; but if the refractory period of a ring of muscle, as in the auricles, is shortened, the wave of contraction travels round continuously and is spoken of as a circus movement. This physiological observation of G. R. Mines was further elucidated as the condition in auricular flutter by Thomas Lewis and his co-workers. The auricles contract extremely rapidly—200 to 300 or more times a minute, the ventricular rate being usually half that. The treatment consists in the production of a certain degree of heart-block by digitalis, or more radically by directly acting on the muscular tissue of the auricle by quinidine sulphate.

Auricular Fibrillation.

The development of knowledge about auricular fibrillation illustrates the close interdependence of clinical medicine and experimental work. Auricular fibrillation, long familiar to physiologists, was first recognised in man by Cushny and Edmunds in a case under their care in 1901 and published in 1906, the fibrillation being ascribed to vagal inhibition; but their diagnosis of fibrillation was received with doubt. In 1902 Mackenzie had recognised the complete irregularity of the pulse now known to be characteristic of auricular fibrillation, and on the ground of the absence of the auricular wave in the jugular tracings argued that the auricles had ceased to contract and were paralysed. In 1907 he abandoned the idea of paralysis, as in some cases at any rate the muscular fibres of the auricles were found by Keith to be hypertrophied, and argued that the auricular and ventricular contractions occurred simultaneously as the result of irritability of the auriculo-ventricular node, and called this "nodal rhythm." In 1910 Rothberger and Winterberg, and Lewis, by means of the electrocardiograph, proved that the auricular condition was one of auricular fibrillation. The condition of nodal rhythm or simultaneous contractions of the auricles and ventricles due to the stimulus starting in the auriculo-ventricular instead of in the sino-auricular node occurs, but is uncommon.

Auricular flutter and auricular fibrillation are closely related and in the same heart one may be transformed into the other; thus under quinidine

fibrillation returns through impure and occasionally pure flutter to a normal rhythm (Lewis, Drury, Iliescu, and Wedd). They are both due to circus movement in the auricles depending on shortening of the refractory period in the muscle-fibres. But in auricular fibrillation the refractory period of the muscle is shorter and as a result the path taken by the circus movement is shorter than and more irregular than in flutter (Lewis, 1921). The muscle-fibres of the auricle contract independently of each other and much more rapidly than in flutter. The auricle fibrillating at the rate of 450 times a minute overwhelms the conducting capacity of the auriculo-ventricular bundle, so that some only of the impulses reach the ventricle, and these are so irregular that the characteristic pulse results.

Quinidine sulphate and digitalis relieve the subjects of auricular fibrillation in different ways; Mackenzie showed the value of digitalis in auricular fibrillation while recognising that it did not restore the auricular contractions, and Cushny and others proved that it acted by inducing a certain amount of heart-block. An enormous amount of experimental work has been done upon the action of digitalis on the heart of cold- and warm-blooded animals, the effects on the two being different. In the mammalian heart contractility and inhibition are increased and then conduction is impaired.

The observations of Lewis and his co-workers upon the action of certain drugs upon fibrillation of the auricles in 1922 showed that quinidine sulphate lengthens the refractory period and so, by closing the gap between the wake and the advance of the circulating way, tends to abolish auricular fibrillation; but in addition it has the antagonistic effect of slowing conduction and so widening the gap between the successive waves. Successful treatment therefore depends on the first effect being predominant, and so enabling the normal pacemaker to regain control.

Paroxysmal Tachycardia.

Paroxysmal tachycardia was described by Cotton (1867), called tachycardia by Gerhardt (1881), received its full title from Bouveret (1889), and was critically considered by Herringham (1897). The polygraph and the electrocardiograph in Mackenzie and Lewis's hands have thrown much light on this clinical syndrome, showing that it is not simply an acceleration of rate, but that the rhythm is abnormal as a result of the stimulus originating not in the sino-auricular node, but elsewhere. The ectopic stimulus may start in the auricle, so that transient attacks may be due to accelerated nodal rhythm (Lewis), to auricular flutter, to auricular fibrillation, or may even originate in the ventricle.

IV. Physiological and Pathological Experiment.

Essential in all branches of medicine, in none except in neurology has experimental physiology been more inseparably connected with progress than in the cardiovascular system. Clinical observation alone, though in the hands of the greatest intellects, has laboured long and often ineffectually, but when aided and corrected by experimental control has rapidly brought about an advance in cardiological knowledge. This difference in the results given by these two ways —clinical observation and experiment—of obtaining new knowledge in medical science, which is so disappointing to the pure clinician that he may not unnaturally contest the statement, depends on the inherent potentialities of the two methods; in clinical observation the conditions cannot be arranged to meet the exact requirements as can be done in a laboratory. The clinical ward has been called the physician's laboratory, but obviously this phrase does not provide the same opportunities for the exact determination of the questions, which are available by the sharp-cut experiments of the physiological laboratory. On the other hand, some care must be taken in transferring the results on animals to the more complex conditions in man. As disease, according to Claude Bernard's definition, is a physiological reaction in altered circumstances, it is obvious that the laws of these reactions can be much more surely established and the modifying circumstances varied and controlled by well-considered animal experiments. Further, animal experiments prepare the way for the application of somewhat similar methods to man, thus Stephen Hales's experiments on blood pressure find their clinical representatives in the modern sphygmomanometers, Marey's tambours, and Mackenzie's polygraph; the observations of electrical changes in muscular contraction eventually led up to the electrocardiograph. Gaskell (1883) proved that the cardiac contractions arise in the muscular tissue independently of the nerves and ganglia, and that the auricles and ventricles have their own automatic rhythm, though normally obedient to the influence of the sinus. This was to some degree foreshadowed by Harvey's observation that if the ventricle of an eel or of various fishes is cut into pieces contractions continue to occur in the several portions. It must not be forgoten that the recognition in 1672 of muscular irritability by Harvey's fellow-Caian, Francis Glisson (1597–1677), which was revived by Albrecht von Haller (1708–1777), who in 1757 stated that the cardiac contractions originated in the muscle, was the first step in the recent elucidation by Gaskell in physiology and in pathology by Lewis and others of cardiac problems.

Although in his second letter to Riolan in 1649 Harvey showed that he was familiar with local disturbances in the character of the cutaneous circulation, it was not until long after the great conception of the circulation as a whole was established that its local characters received special consideration. The effects of embolism, studied by Virchow (1846–56), and independently in this country by W. Senhouse Kirkes (1852), led, from the resulting lesions, to the realisation of end-arteries in the kidney and brain on the one hand, and on the other hand to the recognition of the peculiarities of the circulation in the spleen, lung, and liver, the two last having nutrient arteries (bronchial and hepatic) in addition to the vessels (pulmonary artery and portal vein) conveying blood to be modified in those viscera.

Splenic Circulation.

Nearly 50 years ago Roy pointed out that the splenic circulation differs from that of other organs in the important particular that the force which drives the blood through the organ is not the arterial blood pressure, but chiefly, if not exclusively, the rhythmic contraction of the muscular fibres in the splenic capsule and trabeculæ. Barcroft's observations suggest that in the spleen there are alternative circulations, and that the blood of the large splenic artery may either (1) when not required elsewhere, as it is in the emergencies of exercise or hæmorrhage, accumulate in the splenic pulp, there to undergo changes; or (2) rapidly traverse a by-pass, and incidentally, like the bronchial arteries to the lungs and the hepatic artery to the liver, maintain the nutrition of the viscus. The blood stored in the spleen may contain as much as a quarter of the red cells, and, as shown by Barcroft's experiments with CO poisoning, be practically cut off from the general circulation and so remain free from a poisoned state ruling elsewhere. Anoxæmia stimulates the smooth muscle-fibres in the spleen and so drives out the resting blood; it thus, as Henry Gray (1854) pointed out, regulates the quantity and quality of the circulating blood. While serving as a reservoir the spleen also acts as a metabolic refinery for the red blood cells and a manufactory for the white cells. The resting blood in the spleen deposits any foreign matter, such as bacteria, protozoa, and cells of malignant growths, which may either be destroyed, the process being an immunological asset, or remain and by multiplying there account for the splenomegalies of chronic diseases, such as malaria, kala-azar, "splenic anæmia." As an important storehouse of reticulo-endothelial cells the spleen is concerned with the destruction of the red blood corpuscles, increasing their fragility by what Bottazzi (1895) called

its hæmokatatonistic function, and plays an important part in the first stage of the transformation of effete hæmoglobin into bilirubin.

Wearn's even more recent evidence that the blood in the coronary arteries has alternative circulations, either through the capillaries into the coronary sinus, as usually considered, or directly into the Thebesian or other veins and so into the cardiac cavities, is of obvious importance in connexion with angina pectoris.

These data have a bearing on the question of the reserve power of the organs, which in the past has been regarded as mainly or entirely quantitative in character. Now it would appear that the reserve power may also depend on the utilisation of potential alternative courses of the circulating blood, and that in pathological conditions compensatory processes may maintain the reserve of an organ, as has been mentioned in the case of the heart in coronary obstruction, and is perhaps also shown in the increased size of the hepatic artery in cirrhosis of the liver. The variations in the state of the capillaries—full or empty—in different areas of the body, which Thomas Young clearly anticipated in his forgotten Croonian lecture before the Royal Society in 1810, have been recently brought out by the work of Krogh, Lewis, Dale, and others.

A more accurate knowledge of the unit blood-supply of the kidney and liver is important so as to understand the mechanism and distribution of changes likely to result from blood-borne toxæmias or septicæmias and from chronic vascular disease. With the help of X rays and radio-opaque injection mass, normal and pathological kidneys have been investigated with results encouraging as regards further knowledge about differences between arterio-sclerotic and glomerular nephritis (Graham).

Coronary Circulation.

The coronary arteries are provided with vaso-constrictor nerves from the vagus, and vaso-dilator from the sympathetic (Anrep). Adrenalin undoubtedly dilates the coronary arteries of animals usually employed in laboratory experiments; accordingly Büdingen, at the suggestion of Morawitz and Zahn, treated cases of angina pectoris with hypodermic injections of adrenalin, but the results were negative. Barbour (1912) found that the action of adrenalin causes vaso-constriction of rings of human coronary artery, thus differing from its effects in laboratory animals, and with Prince showed that in the monkey this difference also holds good, the coronary arteries of these two species being presumably supplied with constrictor fibres from the true sympathetic. Reference has already been made to Wearn's observations on the alternative courses in the coronary circulation.

Pulmonary Circulation.

The questions whether or not the branches of the pulmonary artery (1) are under the control of the vasomotor nerves and (2) are acted upon by drugs in the same manner as the systemic vessels are obviously of practical importance in connexion with the causation and treatment of hæmoptysis and pulmonary œdema. The need of an authoritative lead from physiology on these points was very clearly expressed by James Andrew in his Harveian oration of 1901. Vasomotor innervation of the pulmonary vessels was denied until 1871 when Brown-Séquard, who on experimental grounds argued that lesions of the pons caused hæmorrhages, and injuries of the medulla oblongata œdema of the bases of the lungs as a result of impulses transmitted through branches of the sympathetic leaving the cord in the upper dorsal region. Rose Bradford and Dean (1889, 1894) found that in the dog vasomotor nerve-fibres derived from the upper dorsal nerves supply the pulmonary blood-vessels, though the pulmonary vasomotor mechanism is poorly developed as compared with that regulating the systemic arteries. They also concluded that the pulmonary circulation is comparatively independent of the systemic, and that alterations in the blood pressure of the latter must be so considerable as to interfere with the action of the cardiac valves and produce regurgitation before affecting the pulmonary blood pressure. On the other hand, Brodie and Dixon in 1904 denied the vasomotor control of the pulmonary circulation, and in 1928 Dixon and Hoyle confirmed this. In the meanwhile Fühner and Starling, using the heart-lung preparation, found a considerable degree of pulmonary vaso-constriction and a rise of pulmonary arterial pressure with adrenalin, and in 1905 François-Franck came to a similar decision. In a critical review of the extensive work on the subject Wiggers in 1921 concluded that reflex vasomotor effects on the pulmonary circulation must be regarded as probable rather than proved.

The Intracranial Circulation.

The intracranial circulation is remarkable for the rigid cranial cavity and the water-bed of the cerebro-spinal fluid. Whether or not the nerves accompanying the cerebral vessels exert a vasomotor function has been repeatedly investigated, but with discordant results; Roy and Sherrington (1890), L. Hill (1896), and more recently Florey (1925) who found that the cerebral arteries and the cerebral ends of the capillaries react to mechanical, thermal, electrical, and chemical stimuli by contraction and dilatation, agree that there is not any evidence of nervous control over the cerebral vessels. On the other hand, the existence of active functional control of the cerebral vessels by vasomotor nerves has been supported by Claude Bernard (1858), Nothnagel (1867), Wiggers (1915), Forbes and Wolff (1928), and others. The experimental observations are of much interest in connexion with the belief held by many clinicians that transient paralyses, such as occur without evidence of a gross lesion, may be due to spasm of the cerebral arteries analogous to that in Raynaud's disease. Osler (1911), in describing transient attacks of aphasia and paralysis in states of high blood pressure and arterio-sclerosis, accepted the view put forward by Peabody (1891), W. Russell (1909), and others that they were due to transient spasm. Florey has thrown out the suggestion that possibly in pathological conditions, such as arterio-sclerosis, an abnormal metabolic product which has not any effect on normal blood-vessels, may produce spasm of damaged arteries.

The influence of the conditions of the cerebral circulation on the general blood pressure has been much discussed. Starling and Anrep (1925) showed that when imperfectly supplied with blood the vasomotor centre brings about a compensatory rise of blood pressure, thus confirming Cushing's earlier demonstration in 1901 that the vasomotor centre exerts a regulating influence whereby anæmia of the medulla oblongata is prevented when the intracranial pressure is increased above that in the cerebral vessels. This was supported by Bordley and Baker's (1926) observation that in arterio-sclerosis a high blood pressure was definitely associated with sclerosis of the arterioles of the medulla; this, however, was contested by Keith, Wagener, and Kernohan, and Cutler's observations showed that gross vascular changes in the blood-supply to the medulla were not responsible for blood-pressure changes. Experimentally Florey, Marvin, and Drury (1928) found that lowering the blood pressure in the circle of Willis has not any influence upon the general blood pressure.

ASTHMA CLINIC AT BIRMINGHAM.—The governors of Birmingham General Hospital are about to establish a clinic for the treatment of asthma, and will appoint a research worker to make a methodical investigation into the disease.

FAMILIAL LONGEVITY.—On Oct. 11th Mrs. Mary Maidment celebrated her 102nd birthday in the village of Treyford in north-west Sussex. A native of Shaftesbury in Dorset, she belongs to the third centenarian generation of her family, her mother living to be 104, and her maternal grandfather to 100. The elder of Mrs. Maidment's two surviving sons is nearly 80 years of age, and she has two brothers, aged 91 and 84, and a sister aged 81.

THE CILIARY MOVEMENT OF THE TRACHEA STUDIED IN VITRO.

A MEASURE OF TOXICITY.

By LEONARD HILL, M.B. LOND., F.R.S.

(From the National Institute for Medical Research, Hampstead.)

WHILE Purkinje and Valentine discovered ciliary movement in reptiles, birds, and mammalia, Sharpey,[1] by placing the parts in tepid water and using charcoal powder as an index, proved that the direction of this movement in the air passage of mammalia and birds was towards the larynx. Ciliated cells, like white blood corpuscles, are tenacious of life, and live outside the body under suitable conditions for a long time. Sharpey recorded ciliary movement in the tortoise 15 days after death, and in the fresh water mussel movement continued until putrefaction destroyed the gill tissue. Cilia were observed in action by Gosselin[2] in the upper part of the trachea of an executed criminal up to 56 hours after death at a temperature 8–12° C. In another corpse kept at 20° C. the movement did not last so long.

Method.

The trachea of the horse, ox, or sheep, obtained immediately after slaughter and wrapped in a damp cloth to prevent drying, is brought to the laboratory and there cleaned from accessory tissue and cut up into convenient lengths—e.g., about two or three inches; these sections are put into a basin containing Ringer's solution and stored in the cold room or ice-chest. The cilia of the horse trachea remain active for two or three days; even after four days a slow rate of movement may be found.

A length of trachea is taken from the cold room when wanted and cut longitudinally into strips about half an inch wide. The mucous membrane of the posterior part of the trachea, between the cartilages, falls into longitudinal folds and is rejected. A strip of the cartilaginous part is extended by means of pins on a flat sheet of cork, so that the mucous membrane is evenly stretched and quite smooth. The cork is cut to fit the bottom of the basin and is fixed there by a wedge, and the strip of trachea placed exactly in the horizontal position is then covered with Ringer's solution which has been warmed to body temperature; the basin is placed on a metal box under which there is an incandescent electric lamp so arranged as to keep the solution in the basin at body temperature. The Ringer's solution may be aerated occasionally, but oxygen need not be bubbled through it. A very fine suspension of lamp black (de Haen's Hydro-Kollag 150) is used as index of ciliary movement. So fine and even is the suspended powder that it has been used for circulation through the blood capillaries. A little of this suspension diluted with water four or five times is placed on the strip of trachea by means of a teat pipette. Immersed in Ringer at body temperature, the cilia swiftly and cleanly carry the black suspension along the mucous membrane at a rate which may be as fast as 3 cm. in one minute. A wooden centimetre measure is affixed by pins just over and along the strip of trachea, and by means of this and a stop-watch the rate of transit is ascertained and recorded. The drop of black suspension is not only carried along but cleaned right off the strip; a new one can then be put on and the process repeated over and over again.

A powder that flocculates is not carried along so easily as a powder that remains discrete. Finely powdered zinc oxide, barium carbonate, bismuth carbonate, calomel, casein, animal charcoal, iron filings and aluminium filings are carried along well. Lime or sodium bicarbonate stop the cilia by their alkalinity. An inert powder will not be conveyed over a patch after lime has been applied and washed off. Calomel, and silica in the free state, have no injurious effect, even when kept in contact with the cilia overnight.

Kuhne[3] found that cilia were stopped by lack of oxygen—e.g., when a stream of hydrogen was bubbled through the containing water. The cilia could obtain oxygen from oxyhæmoglobin and continue movement until it was all reduced. They were stopped also by a stream of carbon dioxide which made the water acid, and recovered when air or a little ammonium carbonate was added. They were stopped by weak acetic acid and restored by ammonium carbonate sufficient to neutralise the acid. Similarly, when stopped by too much alkali, they were restored by acid.

Ringer's solution, made according to Evans and Underhill's prescription, was at first employed, and oxygen bubbled through it.

Sodium chloride	8·5 g.
Potassium chloride	0·42 g.
Calcium chloride	0·24 g.
Sodium phosphate	0·6 g.
Molar phosphoric acid	0·4 c.cm.
Distilled water..	1000 c.cm.

Later it was found sufficient to employ ordinary Ringer or physiological saline solution without oxygen. Even tap water suffices for an hour or two. The cilia stopped movement when a stream of coal gas was passed through the trachea for one minute, but renewed it on aeration in Ringer's solution.

Results of Experiments.

Rate of Transit.—The cilia of the trachea of the horse, sheep, rabbit, and hen, and the gullet of the frog produce much the same rate of transit, about 1 cm. in 20–30 seconds under the best conditions. The rate in the trachea of small animals such as the rat appears to be slower—e.g., 1 cm. in 2–2½ minutes. In a trachea taken from the post-mortem room a rate of 1 cm. in four minutes was found; the conditions for survival in full vigour had no doubt been unfavourable.

According to Gray, the effectiveness of ciliary movement upon particles placed at a distance of more than four or five times the length of the cilia becomes very small; the average amount of energy imparted to 1 c.cm. of water in unit time by cilia lining a tube is inversely proportional to the radius of the tube. Thick mucous viscid secretion delays the cleansing action. In the gullet of the bull-frog the rate increased from 1 cm. in four minutes to 1 cm. in 45 seconds after such secretion had been removed with a camel hair brush and Ringer's solution.

It is noteworthy that the ciliated mucous membrane can translate not only material, but also itself under suitable conditions. If a strip of mucous membrane from the frog's gullet is hung over a wet horizontal glass rod it will travel along the rod from end to end. The cilia of the gullet of the bull-frog are powerful enough to convey the stomach of the frog if this be cut out and put upon it. They will easily convey a greased 5 g. weight and will slowly move 10 g. and even 15 g. if the gullet is stretched smoothly and horizontally. The work performed by and efficiency of cilia is fully discussed by J. Gray.[4]

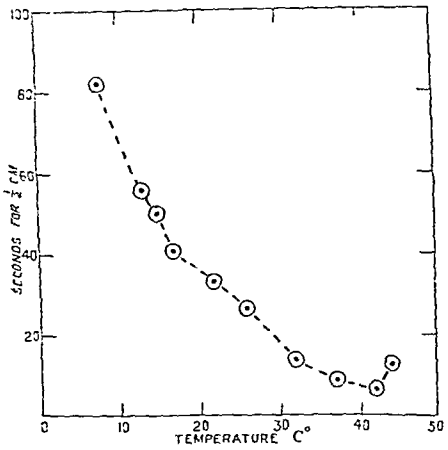
Rate of Movement up the Vertical Surface of the Trachea.—A piece of trachea from a freshly killed horse was stretched vertically in a jar in a moist atmosphere and incubated at body temperature. The mucous membrane was moistened with a little Ringer's solution. A drop of black suspension travelled up at the rate of 1 cm. in 40 seconds; in the horizontal position the rate was 1 cm. in about 20 seconds.

Effect of Stretching the Mucous Membrane.—Races can be run between two strips of horse trachea placed side by side. If the mucous membrane be well stretched and smooth the rate will be the same in each piece; in an unstretched piece the transit is slower. 4 cm. of a stretched piece may even be covered in the same time as 2 cm. of an unstretched piece. The trachea can be lengthened 20 to 25 per cent. by stretching.

The secretion of mucus and its transportation by cilia play an important part in the process of food collection of invertebrate animals. Mucus spread out in a thin layer provides an efficient method of capturing and retaining particles, and is easily transported by cilia. In amphioxus the particles become caught in thin

sheets of mucus, which are often worked up into a long cylindrical mass which travels as a whole.[5] In the trachea of the sheep or rabbit one may see a sheet of thin mucus entangling the black suspension and being pushed up as a cylinder through the larynx as far as the epiglottis. Sometimes the particles of the black suspension cling to networks of stringy mucus, and these become aggregated into clumps, which under normal conditions no doubt may be coughed up. These networks are seen when the mucous membrane is in less good condition. The fresh mucous membrane sweeps itself clean.

FIG. 1.



Injury.—If a small cut be made in the mucous membrane some of the black suspension becomes arrested in transit at this spot while the remainder sweeps round on either side. If two short transverse cuts be made, leaving a central undamaged portion, the black suspension travels through this portion. If a third cut be made beyond the other two and extending over the width of the passage left between the other two, transit is stopped.

Concentration of Dust and Microbes at a Damaged Spot.—If a small area be damaged by a cautery or by a poison such as oxide of mercury or lime, the black suspension is arrested at this spot while cleaned off elsewhere. The experiment illustrates how dust and microbes swept up by the ciliated membrane become concentrated at a damaged spot.

Separation of Mucosa.—If a small area of mucous membrane is separated from the submucosa and replaced the rate of movement continues the same in this as in other parts of the membrane. It is claimed[6] that the movement of cilia in the gullet of the frog is accelerated by stimulation of the sympathetic cord in the region of the brachial plexus, and by the injection of epinephrine and that, on the other hand, it is retarded by stimulation of the medulla oblongata, after this had been isolated from the rest of the neuraxis so that the seventh and ninth nerves alone were excited. It is also claimed that slowing resulted from the injection of pilocarpine.

Gray says that the movement of cilia is generally uninfluenced by the presence of an electric field, but Segerdahl[7] has found that a current of 1 milliampère per sq. cm. passed from the base to the tip of the gill of Anodon increased the rapidity of the action, while the reverse brought the cilia to rest. The response depends to some extent upon the strength of the current used. It seems possible that the results cited above were not due to nervous stimulation, but to spread of current to the cilia.

Effect of Temperature.—This is pronounced, and can be studied by changing the bath of Ringer's solution. Thus—

1 cm. was covered in	165 secs.	at 8·5° C.	1 cm. was covered in	52 secs.	at 26° C.
	112 „	13° C.		28 „	32° C.
	101 „	15° C.		17½ „	37° C.
	82 „	17° C.		15 „	42° C.
	67 „	22° C.		25 „	44° C.

Between 32° and 42° C. the rate of transit is approximately doubled (Fig. 1). At about 43° C. the effect on the cilia of the horse trachea became unfavourable. In the case of the trachea of the fowl a temperature of 44° C. proved most favourable. The rate of movement of small particles by the frontal cilia of the mussel Mytilus is, according to Gray,

	mm. per sec.		mm. per sec.
At 5° C.	0·08	At 22·5° C.	0·70
10° C.	0·15	25° C.	0·86
15° C.	0·40	30° C.	1·17
20° C.	0·60	32·5° C.	1·33
			= 0·8 cm. per min.

After 35° C. these cilia become less efficient and go into heat coma at 40° C. and heat rigor at 45° C. The maximal speed of the cilia of the frog's gullet is at 35° C., and heat rigor occurs at 45° C. (Gray, p. 78.)

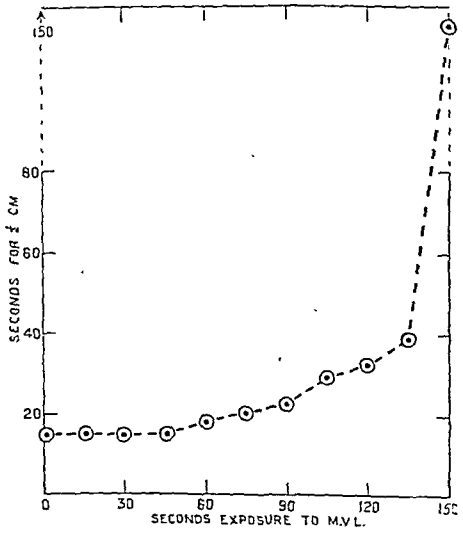
Effect of Ultra-violet Rays.—A frog's gullet was exposed to a mercury-vapour lamp 33 cm. distant with and without a glass screen. After four minutes' exposure the cilia in the unscreened gullet stopped movement, but those under the glass screen remained unaffected.

Horse Trachea Exposed to Mercury-vapour Lamp at 1 ft.: Rate of Transit.

Before exposure	1 cm. in	30 secs.
After 30 secs. exposure	„	30 „
„ 60 „	„	36 „
„ 90 „	„	45 „
„ 170 „	„	63 „
„ 135 „	„	78 „
„ 150 „	„	290 „

The lamp stopped the cilia of the exposed horse trachea in about five minutes. When it was screened with the mesentery of a rat it was stopped in about 30 minutes, and when screened with Vita-glass in about 60 minutes. It took eight times as long to stop infusoria screened by the mesentery as when they were exposed in an unscreened quartz chamber, while a screen of the bladder or shaved abdominal skin of the rabbit protected them (Fig. 2).

FIG. 2.



Small doses of ultra-violet rays do not accelerate ciliary movement; larger ones slow and stop the cilia.

Vitamin Deficiency and Ciliary Action.—Eight young rats just weaned were fed on a vitamin A and D deficient diet; they ceased to grow and developed xerophthalmia, with inflammation of ears and tail. They were then killed and their tracheas tested against those of four normal rats. The black suspension was conveyed at an average of 1 cm. in 2 min. 25 sec. in the normal and 1 cm. in 2 min. 15 sec. in the vitamin A and D deficient rats.

The rate of ciliary movement, therefore, was not affected by a vitamin A and D deficient diet.

Effect of Drugs.

Purkinje and Valentine observed, says Sharpey, that watery infusions of opium, belladonna, capsicum, catechu, aloes, musk, gum arabic, acetate of morphia, and nitrate of strychnia had no effect on the cilia. Movement was arrested by a 10 per cent. hydrocyanic acid solution, by acid, alkali, and salt in abnormal concentration, and by a certain concentration of

alcohol, ether, sugar, empyrheumatic oil, creosote, muriate of baryta, sulphate of quinine, infusions of pyrethrum, and muriate of veratrum. J. Gray says that the supply of available energy of the cilia of Mytilus is augmented by veratrum and by increasing the K and OH ions and by lessening Mg ions. While cilia are sensitive to the hydrogen-ion concentration the concentration required to arrest them depends on that to which they are normally exposed.

I. W. Hach,[8] by means of a suitable preliminary operation, has made a bronchus of the lower lobe of the lung of the dog available for the introduction of lycopodium spores stained with fuchsin. The spores were introduced when the animal was not under narcosis, and the time of their arrival at a tracheotomy wound was noted. The average rate of transit was about 0·5 cm. a minute. He claims that an injection of morphia into the dog made the rate slower, and of caffeine quicker.

The effect of drugs on the horse trachea can be studied by adding them in known dilution to the Ringer's solution, and that of anæsthetics and poison gases by exposing the strip of trachea for a given time in a vessel full of air containing a known percentage of the vapour or gas.

Absolute Alcohol.—There was no evidence that alcohol brought about an increased rate of movement. In 0·2 per cent. alcohol by volume the rate was 28 secs. for 1 cm.; in 0·4 per cent., 28 secs.; in 1·0 per cent., 26 secs.; in 0·6 per cent., 30 secs. Again, the rate was 1 cm. in 24 secs. in Ringer's solution at 38° C.

Per cent.		Secs.		
1	Absolute alcohol by volume.	1 cm. in 24 at 38° C.	:	No effect.
2		,, 38	,,	Increasingly slow.
3		,, 48	,,	
4		,, 100	,,	

The cilia may recover in pure Ringer's solution. Again—

Per cent.		Secs.	
0·5	Absolute alcohol by volume.	1 cm. in 29	At 36·5° C. (See Fig 3.)
1·0		,, 31	
1·5		,, 32	
2·0		,, 43	
3·0		,, 60	
4·0		,, 85	
5·0		,, 142	

Some absolute alcohol was poured on a piece of trachea and then washed off with Ringer. As the cilia were still active they must have been protected by the layer of mucus, the mucin of which becomes coagulated by the alcohol. The cilia of the horse trachea may slowly move in Ringer's solution containing 10 per cent. by volume of absolute alcohol, but there is no movement in 20 per cent. alcohol. 10 per cent. of absolute alcohol stopped the cilia of a fowl's trachea, and 5 per cent. stopped those of a rabbit's trachea. Infusoria were slow in 5 per cent. and stopped in 10 per cent. absolute alcohol. It is known that white corpuscles continue to show amœboid movement in 10 per cent. of alcohol.

A weak percentage of alcohol has no effect and a strong one retards ciliary movement.

Oil of Eucalyptus.—Oxygen was bubbled through a wash bottle containing water and some eucalyptus oil, and then through Ringer's solution in which was a piece of horse trachea. There was no effect on the rate of ciliary movement. Some drops of eucalyptus oil were added to the basin and stirred up in the Ringer's solution; the rate became slower and movement stopped after about 30 minutes.

Two pieces of horse trachea were raced one against the other. Each carried the black suspension along 1 cm. in 23 secs. After two minutes' exposure of one under a bell-glass to a strongly smelling eucalyptus vapour there was no difference in rate.

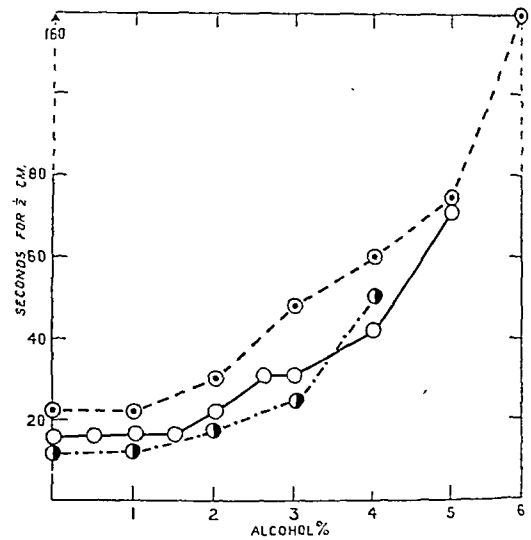
Vapour of eucalyptus appears to be harmless to cilia.

Ether and Chloroform Contrasted.—The ciliary movement in two pieces of horse trachea was raced and found equal. One piece was exposed to strong ether vapour. After three minutes' exposure there was no difference. After five minutes' exposure the movement was 30 per cent. slower on first trial, but on second trial there was no difference, recovery in pure air having quickly taken place. Exposure for one minute to strong chloroform vapour caused slowing of the rate, and there was no quick recovery.

The movement in a piece of horse trachea was active after three minutes' exposure under bell-glass to air saturated with ether. The movement stopped after similar exposure to chloroform. When either ether or chloroform were poured over a piece of trachea and then at once washed off in Ringer the ciliary action was stopped.

A rat was killed with ether under a bell-glass and left there for three-quarters of an hour. After the

FIG. 3.



trachea had been excised and put in aerated Ringer the ciliary movement produced a transit of 1 cm. in two and a half minutes. A rat was made almost moribund with ether and the trachea excised. The rate of ciliary movement was 1 cm. in one and a half minutes. The rate in a piece of horse trachea in Ringer's solution at 35° C. was 1 cm. in 24 secs. The Ringer's solution was saturated with ether, the rate at first was unchanged, but after five minutes it was 1 cm. in 55 secs. In fresh aerated Ringer it became 1 cm. in 26 secs.

Water saturated with ether contains 1 in 12 at 17½° C.

In a rabbit under urethane the trachea was opened in situ and the interior moistened with Ringer's solution; the black suspension travelled 1 cm. in 35 secs. Wool saturated with ether was then placed over the tracheal opening so that the animal inhaled the vapour; the rate of transit became 1 cm. in 58 secs., but quickened after the removal of the ether to 1 cm. in 30 secs.

The ciliary movement in a piece of horse trachea was 1 cm. in 24 secs. in Ringer's solution at 35° C.; five minutes after the Ringer's solution had been saturated with chloroform the rate of movement was 1 cm. in four minutes. In fresh aerated Ringer it became 1 cm. in 35 secs.

Chloroform is much more poisonous to cilia than ether. The cilia survive exposure to either used as an anæsthetic, the rate of movement being little affected by ether.

Caffeine.—1 per cent. of caffeine in Ringer's solution produced no acceleration of the ciliary movement.

Urethane.—A rabbit was killed by excessive dose. The cilia were active, as shown by a rate of 1 cm. in 43 secs.

Isopropyl Alcohol.—In 5 per cent. solution cilia continue to be active; in 10 per cent. they almost stop.

Acetone.—A solution of 0·5 per cent. stops infusoria. The cilia of the trachea continue to move slowly, even in 10 per cent.

Octyl Alcohol.—When 0·1 per cent. was used to lower the surface tension of the Ringer's solution there was no difference in ciliary movement.

Ammonium Carbonate.—Up to 1·5 per cent. in Ringer's solution had no effect on the rate of movement.

Ammonium Chloride.—In a 0·25 per cent. solution this had no effect, but a strength of 0·5 per cent. slowed the rate.

Ammonia.—Sufficient ammonia to make Ringer's solution just alkaline to litmus almost stopped ciliary movement; 0·5 per cent. of ammonia (sp. gr. 0·880) in Ringer's solution killed the cilia. Small concentrations of ammonia or its salts produced no acceleration of ciliary movement.

Mercury alanin, 1 in 1000, is lethal to cilia.

Milton, a commercial hypochlorite solution in which 1·08 per cent. of chlorine is available, stopped the movement of infusoria in a concentration of 1 in 1500 to 1 in 2000. 1 in 200 did not stop the cilia of the horse trachea, but 1 in 100 did. The directions given are to use one teaspoonful in 3 pints as a nasal douche = about 1 in 400; this dose appears reasonable.

Mercuric chloride, about 1 in 20,000, stops the cilia of the horse trachea.

Chloramine T. (p-toluene-sodium sulphochloramide).—This slowed, but did not stop the action of the cilia of the horse trachea in the 0·25 per cent. dilution, which is recommended for nasal irrigation.

Monsol.—A solution of 1 in 1000 is recommended as a nasal douche. One part in 2000 was found to slow cilia.

A Popular Prescription for a Nasal Spray—

Thymol	gr. iv.
Camphor	gr. v.
Ol. cinnamoni	♏. v.
Menthol	gr. x.
Liq. paraffin..	℥ i.

Some drops of this shaken up in a tube of water with infusoria stopped them, but drops standing on top of water in a tube had no effect on infusorial movement. Some of this prescription was put on a piece of horse trachea and left for five minutes; the cilia showed active movement in Ringer's solution.

This prescription appeared to be harmless to cilia.

Carbolic Acid.—A 1 in 600 to 1 in 700 solution almost stops the cilia of the horse trachea; 1 in 1000 slows them.

Glycothymoline in full strength appeared to be harmless to the cilia.

Potassium Permanganate.—It requires a concentration of 1 in 1500 to stop the cilia of the horse trachea; 1 in 10,000 stops the movement of infusoria. Solutions weaker than 1 in 1500 seem very suitable for a nasal douche.

Sanitas.—The cilia move actively in 1 per cent. solution, slowly in 5 per cent. Infusoria appear to be much less sensitive; they were active in 15 per cent., but stopped in 20 per cent. For use as a nasal douche a 25 per cent. solution is recommended; this seems too strong for the cilia.

Hydrogen Peroxide, 3 per cent. Commercial Solution (Acid).—One part of this solution in 5 Ringer made the cilia move slowly; 1 in 3 stopped them. One part in 10 stopped infusoria after a time. A 1 per cent. solution of pure neutral hydrogen peroxide stopped cilia.

Potassium Chloride.—Gray states that an increase of potassium chloride in Ringer's solution accelerates the cilia of invertebrata. The addition of either 20 or 40 c.cm. of 0·2 per cent. potassium chloride to 200 c.cm. of Ringer's solution had no accelerating effect on the cilia of the horse trachea.

Arsenical War-gas Fumes.—A specimen was fumed by heat in a flask and the piece of trachea lowered into the fumes; on withdrawal, after exposure for one minute, the ciliary movement was slow. Sneezing was excited by the slightest whiff from the flask when this was momentarily opened out of doors; one part in some 10 millions of air suffices to irritate the nose. The concentration required to act on nerve-endings in the nose and produce very severe sensory disturbance is far less than that required to damage the cilia.

Bromine Gas, 1 in 5000.—The cilia stopped after exposure to this for 6–7 seconds. Infusoria were also stopped when they were exposed in a drop clinging to a glass rod lowered into the gas.

Anaphylaxis.—Six guinea-pigs were sensitised to horse serum; there was no effect from putting horse serum on the excised trachea of three of these animals, but the other three showed the usual phenomena of anaphylaxis on injection of horse serum.

Diphtheria toxin had no effect on the cilia of the trachea.

Adrenalin, acetyl choline, and histamine added to baths of Ringer in concentration sufficient to act powerfully on the uterus of a guinea-pig had no effect on the cilia of the trachea.

The method described in this paper is one which lends itself readily to the testing of the toxicity of solutions and vapours used on the respiratory membrane.

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JEJUNAL AND GASTRO-JEJUNAL ULCERS.

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II.* *Symptoms and Diagnosis.*

IN about 20 per cent. of cases the gastro-jejunal or jejunal ulcer appears to develop immediately after the operation, and the symptoms caused by the original ulcer before the operation merge into those caused by the new anastomotic ulcer without any interval of complete freedom. In a New Lodge Clinic series of 34 cases 7 had had no relief after the operation; 9 were relieved for a few months only, 12 for between one and two years, and 6 for between two and 12 years. In one of our hospital patients there was an interval of 17 years between the performance of a gastro-jejunostomy and the perforation of a jejunal ulcer; symptoms had been completely absent for the first 14 years, when a new ulcer developed in the duodenum and eventually perforated two years before the perforation of the jejunal ulcer. It is obvious, therefore, that Sherren was wrong when he stated that a patient who had had no symptoms for two years after a gastro-jejunostomy could be regarded as free from the danger of an ulcer.

In a series of 10,300 autopsies at Leeds there were 25 cases of jejunal ulceration and scarring, of which 22 had survived the original operation for periods varying between 9 months and 19 years; 21 of these had had freedom from symptoms for periods ranging from two months to 15 years. Three patients who died 18 days, 22 days, and 35 days respectively after operation were the subjects of acute jejunal ulceration, and in one of these hæmorrhage from the ulcer was the immediate cause of death, but such cases are exceptional.

* Part I. appeared last week.

In many cases the onset of symptoms is the immediate sequel of an indiscretion in diet or the consumption of excess of alcohol. In others it follows a period of worry or over-work, or a "chill" due to exposure to cold and damp. It is uncommon for patients, who have been free from symptoms for a year after the operation, to develop an anastomotic ulcer later if they continue to be careful about their diet and to avoid alcohol and excessive smoking.

The symptoms are similar to those of the original duodenal ulcer and sometimes show a similar periodicity, but the time of onset of the pain is more irregular and is generally earlier after meals, being less completely relieved by food and by sodium bicarbonate. Sometimes, however, it is delayed as long as with the original duodenal ulcer. The pain is almost invariably situated nearly on a level with the umbilicus instead of being higher up in the epigastrium, and it is generally to the left of the middle line, instead of in the centre or right as with the original duodenal ulcer. It is sometimes aggravated by exercise, particularly by twisting or bending; this is very likely to occur in the rare cases in which the ulcer is adherent to the anterior abdominal wall. The patient may also complain of nausea and flatulence, but vomiting is rare. He may so restrict his diet in his effort to prevent the pain that great emaciation results.

Hæmatemesis or melæna may occur without any previous symptoms. In two of the New Lodge Clinic series profuse hæmorrhage took place at intervals with no other symptoms, beginning two years after a gastro-jejunostomy had been performed for a duodenal ulcer. It may be preceded by a short period of indigestion, or it may occur as an incident in patients with chronic indigestion. It appears to be more common with anastomotic ulcers than with gastric and duodenal ulcers; thus in the New Lodge Clinic series of 204 patients with a chronic ulcer there were 35 (17 per cent.) with a gastro-jejunal or jejunal ulcer; but of 51 who gave a history of severe hæmorrhage 16 (32 per cent.) had an anastomotic ulcer. Altogether hæmorrhage occurred in 21 out of 43 cases of anastomotic ulcer. In two instances hæmatemesis occurred alone, in 14 melæna alone, and in 5 both hæmatemesis and melæna. In 7 of the 21 hæmorrhage had also occurred from the original duodenal ulcer, but in every instance the number and severity of the hæmorrhages were greater after the operation than before. In six additional cases hæmorrhage had occurred before the operation, but not afterwards from the anastomotic ulcer.

Severe anæmia may result from repeated hæmorrhage. In spite of its frequent severity the hæmorrhage did not prove fatal in any of the New Lodge Clinic series of cases, and in only one of the 22 autopsy cases in Leeds was hæmorrhage the immediate cause of death. In a case at Guy's Hospital medical treatment failed to arrest the hæmorrhage, which was not associated with any other symptoms; operation was therefore advised, but as no ulcer could be seen or felt, a jejunostomy was performed. The hæmorrhage ceased, but unfortunately the jejunum became detached from the abdominal wall and the patient died from peritonitis. At the autopsy no ulcer was found. Presumably the hæmorrhage had taken place from an acute jejunal ulcer, which had healed in the interval; this would also account for the absence of pain. In two of the Leeds cases, both jejunal, one of them with a jejuno-colic fistula, considerable hæmorrhage occurred in the last few weeks or months of life, and in another case death was due to hæmorrhage from a chronic gastric ulcer nine months after the gastro-jejunostomy had been undone. A fractional test-meal only rarely shows the presence of blood in one or more specimens, but in 84 per cent. of the New Lodge Clinic cases occult blood was found in the stools.

Local tenderness is frequently present over the ulcer and it is often associated with muscular rigidity. Occasionally a definite swelling or induration is felt, due to plastic peritonitis with or without adhesions to the abdominal wall.

Table II. shows the amount of free acid found in the fractional test-meals. No less than 34 per cent. show hyperchlorhydria and an additional 40 per cent. a high normal in spite of the gastro-jejunostomy.

TABLE II.—*Results of Fractional Test-meals in 38 Cases of Anastomotic Ulcer at New Lodge Clinic.* (Evans Jones.)

Acidity (Bell's classification).	Number and percentage.
Hyperchlorhydria	13 (34)
High normal	15 (40)
Normal	5 (13)
Low normal	2 (5)
Hypochlorhydria	1 (3)
Achlorhydria	2 (5)

Porges and others have shown that the achlorhydria occasionally found after a test breakfast in patients with anastomotic ulcers is only apparent, as free acid is always present if the gastric contents are examined after a larger meal.

In one case a "high normal" curve was obtained in a patient on whom "almost complete gastrectomy" had been performed for a gastric and a jejunal ulcer four years after the original gastro-jejunostomy and four years before admission to the Clinic.

Bile was present in every fraction in 45 per cent. of cases and in some fractions in an additional 38 per cent. In the remaining 17 per cent. none was present, presumably owing to the anatomical conditions at the stoma causing all the contents of the proximal limb of the jejunum to pass directly into the distal limb without gaining access to the stomach; in some of these cases bile appeared in the gastric contents after medical treatment had caused the ulcer to heal, the obstruction apparently having been due to inflammatory swelling round the ulcer (Chart VI.).

With the X rays an opaque meal can be seen leaving via the stoma. Palpation under the screen then shows that the tenderness is strictly localised to the stoma or to some point in the first 4 inches of the efferent limb of the jejunum, this being generally the only clinical means by which gastro-jejunal and jejunal ulcers can be distinguished from each other. In most cases the stomach empties rapidly, as it does after an ordinary successful gastro-jejunostomy. In chronic cases, however, the stoma may become obstructed; a fractional test-meal and the X rays then show delay in evacuation (Charts I. and II.), and the latter may reveal exaggerated peristalsis and dilatation of the stomach if the pylorus is also obstructed.

Occasionally some deformity in the region of the stoma can be recognised with the X rays, but the majority of anastomotic ulcers are very difficult to reveal radiographically.

It is very important to ascertain whether the pylorus is still patent—if necessary, by examining the patient whilst lying on his right side, as the possibility of undoing the gastro-jejunostomy depends upon this.

Diagnosis.—When symptoms recur after gastro-jejunostomy the possibility of jejunal ulceration should always be considered. It has to be distinguished from persistence or recurrence of duodenal or gastric ulcer, chronic appendicitis or gall-bladder disease overlooked at the time of the first operation or possibly developing at a later date, and, very rarely, carcinoma supervening upon an unhealed gastric ulcer or originating at the stoma.

When the X rays show that all the gastric contents pass out by the stoma and that nothing reaches the duodenum by way of the pylorus, it can be confidently assumed that the symptoms are not due to recurrence or persistence of ulceration of the duodenum. The recurrence or persistence of a gastric or duodenal ulcer leads to the same symptoms as before the operation, the position and time of occurrence of the pain being unaltered. As already pointed out, the pain and tenderness in gastro-jejunal and jejunal ulcer are generally to the left of

the middle line and always lower down than in duodenal ulcer. Moreover, the pain is more capricious and intractable. The pain never begins immediately after meals if a duodenal ulcer is unhealed, and a considerable proportion of the food is seen with the X rays to pass through the pylorus.

Fullness and discomfort to the left of the umbilicus immediately after meals, often associated with diarrhœa, are not uncommon after gastro-jejunostomy, but they are not due to the presence of ulceration. Tenderness over the stoma or some point in the first few inches of the distal loop of jejunum, and, more conclusively, the occurrence of obvious hæmorrhage or the presence of occult blood in the stools, point to the presence of an ulcer.

III. *Complications.*

Perforation.—This is the most serious and one of the most frequent of the complications of jejunal ulcer. In Lieblein's (1915) collected series the incidence of perforation was 23 per cent. (30 out of 129 cases), and in Wright's (1918–19) series 19 per cent. (32 out of 165 cases). These figures, however, exaggerate the frequency of perforation, as they only include cases coming to operation and exclude the comparatively large number without perforation which respond more or less satisfactorily to medical treatment.

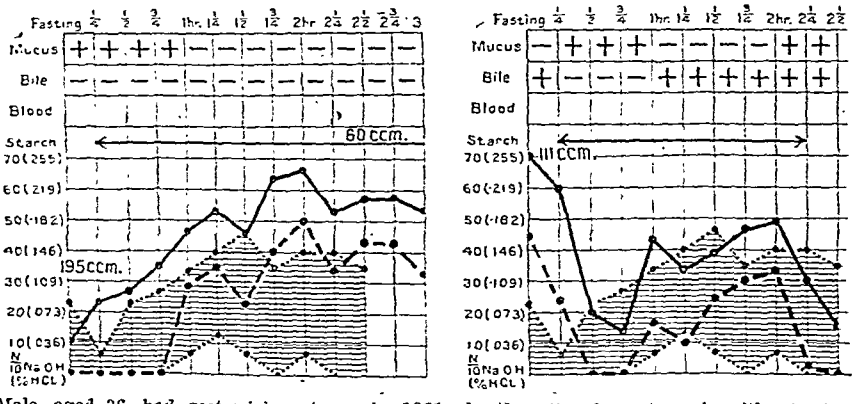
In the majority of cases it is the true jejunal and not the gastro-jejunal ulcer which perforates. Thus of 38 perforated ulcers collected by Massie (1924), 8 were at the anastomosis and 30 in the jejunum.

There are two chief varieties of perforation: (*a*) into the peritoneal sac, and (*b*) into the transverse colon after adhesions have formed with the base of the ulcer. Some indication of the comparative frequency is given by our post-mortem findings. In the Leeds series of 22 cases a second jejunal ulcer occurred in four, and in one of these a third. This gives a total of 27 ulcers, seven of which, all of them jejunal, perforated into the peritoneum and seven, including six jejunal, into the transverse colon. One case is common to both groups, perforation into the peritoneum taking place six weeks after the apparent date of formation of the jejuno-colic fistula. In another case two successive jejunal ulcers perforated, an interval of four years and four months elapsing. In the great majority the perforation occurred without appreciable symptomatic warning. Of the seven intraperitoneal perforations, five apparently occurred without previous symptoms; in one there had been symptoms suggestive of jejunal ulcer for six years with tarry stools for five weeks, and in one there had been symptoms for eight months.

The interval between the date of the original operation and the occurrence of free perforation into the peritoneum varied in the seven cases from nine months to ten years, with an average of five years. When jejunal ulceration follows anterior gastro-jejunostomy there is a considerable likelihood of the ulcer becoming adherent to the anterior abdominal wall, and in very rare instances it may perforate in this situation, forming an external fistula (Paterson, 1909 (*a*)).

Jejuno-colic, gastro-jejuno-colic, and gastro-colic fistula.—In about 10 per cent. of cases of gastro-jejunal and jejunal ulcers coming to operation and in 2 out of the 43 New Lodge Clinic cases, perforation into the colon with the production of a fistula has taken place. As a rule, the fistula is truly jejuno-colic, although its jejunal termination is usually close to the anastomotic line. Occasionally it is gastro-colic or gastro-jejuno-colic when there is free and direct communication between all three viscera. In a case reported by Hartmann (1926) two separate fistulæ, jejuno-colic and gastro-jejuno-colic, were present, and in a Guy's case described by Brook (1928) there were two distinct gastro-colic fistulæ. Sometimes there is direct communication without the intervention of any appreciable fistulous track, much in the same way that the stomach and jejunum communicate after gastro-jejunostomy. In others the communication is small and even valve-like, so that the symptoms are intermittent. These two results are probably brought about in different ways. In the first the floor of the jejunal ulcer is in close contact with the wall of the colon from the outset; in the second these structures are some distance apart and it is by involvement first of the mesocolon and its gradual thickening and contraction that the two are sufficiently approximated to allow the fistulous communication to take place. The formation of the fistula is usually followed by the rapid healing of the jejunal ulcer, and the pain arising therefrom may disappear. On the other hand, gastric analysis may still show a fairly high content of free HCl, and the possibility of further peptic ulceration in the colon should be borne in mind. It is by no means uncommon for the transverse colon to become stenosed at a point 1 or 2 cm. below the opening of the fistula; it is a reasonable supposition that this also is the result of peptic ulceration and healing. One of the Leeds cases showed it.

CHART VI.



Male, aged 36, had gastro-jejunostomy in 1921 shortly after hæmatemesis without other symptoms. Gastro-jejunal ulcer symptoms developed at once and continued till admission to New Lodge Clinic, Jan. 1st, 1926.* Much occult blood. Test-meal (A) showed 195 c.cm. resting juice and 60 c.cm. starch-containing acid fluid at three hours; no bile. Treatment with diet, atropine, and evacuation every night resulted in disappearance of symptoms and occult blood. Test-meal (B) on Feb. 4th, 1926, only 111 c.cm. resting juice and evacuation complete in two and a half hours, and bile *now enters stomach*, as œdema and congestion causing obstruction round ulcer causing obstruction to stoma now disappeared.

The interval which elapsed between the original gastro-jejunostomy and the first appearance of the signs and symptoms of fistula varied in our cases between 2½ months and 20 years. The average interval in 19 cases at the Mayo Clinic was five years (Verbrugge, 1925), and in 11 Leeds, Guy's, and New Lodge Clinic cases seven years. All the cases so far recorded have been in men. In the Mayo Clinic series the original operation had been performed for duodenal ulcer in 17 cases and for gastric ulcer in 2. In the Guy's and New Lodge series of 9 cases, 7 followed an operation for duodenal ulcer, 1 "pyloric ulcer," and 1 gastric ulcer (Brook). In the Leeds series all the 7 cases followed an operation for duodenal ulcer.

The onset is generally rapid, but in some cases premonitory symptoms of jejunal ulcer have existed

for some time. The symptoms vary a good deal in different cases, depending on the size and character of the fistula and its exact situation. In gastro-colic and gastro-jejuno-colic fistula the full syndrome of violent diarrhœa with the presence of undigested food in the stools, fæcal vomiting, the belching of foul-smelling gases, and rapid emaciation is often met with. In jejuno-colic fistula diarrhœa, more or less severe and often intermittent, is generally the chief symptom, but in a New Lodge Clinic case there was severe constipation, the symptoms closely simulating those of carcinoma of the colon. Vomiting, sometimes fæculent, also tends to be intermittent, and to come on at times when the diarrhœa is worst. This is dependent, of course, on the readier passage of fluid fæces through a narrow fistula, and inquiry will usually elicit the fact that the patient feels at his best when the bowels are constipated. The belching of gas with a fæcal odour is a very important diagnostic sign, since it may be present in the absence of vomiting, and occurs in no other condition except pyloric cancer. Pain, when present, is colicky in type, and differs, therefore, from the more continuous pain of a gastro-jejunal or jejunal ulcer. The degree of wasting depends on the severity of the other symptoms and is likely to be extreme in the later stages.

A radiological examination after an opaque meal or enema confirms the presence of a fistula, and fæcal material may be found in the gastric contents.

Jejuno-colic fistula may be survived for considerable periods and ultimately prove fatal from sheer exhaustion and starvation, as in three of the cases in our autopsy series. In one, the symptoms of fistula had been constantly present for over three years, in another intermittently for a like period, and in a third continually for 15 months. In one of the remaining four a remedial operation was successfully carried out after a year, death occurring ten months later. In one the symptoms of fistula had lasted for six weeks when perforation into the peritoneum led to a fatal issue (Fig. 3), in one, after eight months, a stercoral ulcer in the pelvic colon perforated, and in the seventh and last death followed a detaching operation four months after the onset of symptoms.

There is no doubt that post-operative jejuno-colic fistula is increasing in frequency, presumably pari passu after a certain interval with the number of cases of duodenal ulcer treated by gastro-jejunostomy. Judd (1921) met with the complication six times in his series of 101 cases of jejunal ulcer, but four years later (Verbrugge, 1925) the number treated at the Mayo Clinic had risen to 21. Bolton and Trotter in 1920 were able to collect 31 cases in all, including four of their own. In 1925 Verbrugge collected 95, including the 21 from the Mayo Clinic. All the 7 cases in the Leeds post-mortem series have occurred in the last three years, 1 in 1925, 2 in 1926, and 4 in 1927. Of the 9 cases in the Guy's and New Lodge series 1 occurred in 1915, 1 in 1922, 3 in 1926, 3 in 1927, and 1 in 1928 (Brook). No single case was met with in the post-mortem room at Leeds between the years 1910 and 1924 inclusive, although several cases were successfully treated in the wards during this period.

IV. *Prophylaxis and Treatment.*

If gastro-jejunostomy was only performed when there is a visible and palpable ulcer causing obstruction of the pylorus or duodenum; if before the operation every possible source of infection in the mouth and pharynx was removed; if at the operation any associated disease of the appendix or gall-bladder was dealt with; if after the operation the patient was given adequate instructions with regard to diet and told to take additional feeds between meals; and if moderation in smoking and the taking of olive oil before meals were also enjoined, then the chances that a gastro-jejunal or jejunal ulcer might develop would be reduced to a minimum. Under such conditions these complications would rarely, if ever, arise in the absence of some gross error in technique.

Evans Jones has pointed out the remarkable fact that among our New Lodge Clinic series of 34 cases of jejunal and gastro-jejunal ulcer a complete investigation with the X rays, test-meal, and examination of the stools for occult blood has been carried out in no single case before the original gastro-jejunostomy was performed. Even a radiological examination had only been made in seven, or 20 per cent., of the cases. Only six, or 17 per cent., had previously been given any medical treatment worthy of the name, and in none of these had it been sufficiently prolonged to give the ulcer a real chance of healing. Pyorrhœa alveolaris, apical dental infection, or both, was present in 80 per cent. of case, and in some well-marked infection of the tonsils or nasal sinuses was also found. In very few cases had any attempt been made to deal with these foci of infection before the operation. Lastly, none of the patients had been given precise instructions with regard to diet and the other precautions required to prevent a recurrence of ulceration. It must be remembered that all the patients were private cases, operated on by well-known and experienced surgeons, who could have insisted upon the conditions both before and after operation being satisfactory.

With no adequate preliminary examination or treatment to decide whether an operation was really required, with insufficient attention to the removal of septic foci, and with grossly inadequate after-treatment, it is hardly surprising that these patients developed a jejunal or gastro-jejunal ulcer, and that five who had a second operation performed under equally unsatisfactory conditions before they came to the Clinic developed a second anastomotic ulcer.

The primary operation was performed between 1915 and 1925 in all but four cases, and in no instance before 1910, so that there can be no question of old-fashioned and discarded methods of operation having been used. This series of cases seen in New Lodge Clinic between 1921 and 1928 received no more adequate preliminary investigation or medical treatment before operation or after-treatment after operation than the cases of jejunal and gastro-jejunal ulcer seen in private practice between 1908 and 1915 and in 1920.

(*a*) *Medical Treatment.*—Strict medical treatment on the lines we have laid down elsewhere for gastric and duodenal ulcer should be very thoroughly tried, and, if successful, the patient should be given definite instructions with regard to diet and the other necessary precautions in order to avoid any chance of recurrence. One patient, who had remained well for six years after medical treatment had led to the healing of a jejunal ulcer, which had been present when he was first seen four years after a gastro-jejunostomy for duodenal ulcer, had a relapse with pain and severe hæmorrhage when he decided on his own responsibility that he would no longer follow the rules laid down for him with regard to diet, alcohol, and tobacco. The new jejunal ulcer also healed under prolonged medical treatment.

It is extremely important to eradicate every possible source of infection in the mouth, pharynx, or elsewhere. In the early stages medical treatment often succeeds, and it can sometimes avail even when definite obstruction of the stoma is present owing to inflammatory swelling and œdema round a gastro-jejunal ulcer. This was well seen in the case from which the test-meals shown in Chart V. were obtained; the delayed evacuation present when the ulcer was active disappeared under treatment, and bile, though absent from all fractions at first, entered the stomach through the stoma when the ulcer had healed. When, however, severe obstruction is present, and whenever prolonged medical treatment fails to give relief, resort should be had to surgery.

(*b*) *Surgical Treatment.*—We feel convinced that the best as well as the simplest operation for gastro-jejunal and jejunal ulcer is local excision, together with restoration of the stomach and jejunum to their normal anatomy. As the duodenal ulcer has almost invariably healed, the gastro-jejunostomy has done its work, and there is no object in performing another, as the usual precautions taken to avoid the recurrence

of a duodenal ulcer after medical treatment should suffice to keep the patient free from danger of a new ulcer developing in the duodenum. On the other hand, it is not at all uncommon for a second gastro-jejunal or jejunal ulcer to develop if a second gastro-jejunostomy is performed. A second jejunal ulcer is likely to be much more difficult to cure medically than a new duodenal ulcer in the unlikely event of *one forming if a second short-circuiting operation is* not performed. A gastro-duodenostomy is no better in this respect than a second gastro-jejunostomy. Only in the rare cases in which a jejunal ulcer develops after a gastro-jejunostomy performed for pyloric obstruction is it necessary to make a new gastro-jejunostomy after the anastomotic ulcer has been excised.

The much more difficult and dangerous operation of partial gastrectomy is only justifiable under very exceptional conditions. The mortality in cases of jejunal ulcer in Eiselsberg's clinic was no less than 25 per cent. Klein (1927) has shown that in only two out of six cases was the operation followed by achlorhydria, so that the risk of a new jejunal ulcer or gastric ulcer developing remains in 66 per cent. of cases. Birgfeld in 1925 collected 15 cases from the German literature, in which a new anastomotic ulcer had developed after partial gastrectomy performed for a jejunal ulcer—the result in most instances of a gastro-jejunostomy performed for a duodenal ulcer. Finsterer, however, believes that if at least three-quarters of the stomach are removed recurrence never occurs, as complete achlorhydria results; his mortality is only 9 per cent. in 76 cases.

The treatment of gastro-jejuno-colic fistula is, of course, always surgical. But the operation is likely to be very difficult, and the immediate mortality in 63 cases collected by Loewy was 27 per cent., though in the nine Guy's and New Lodge cases there were no deaths. In addition to this, recurrence of ulceration occurred in 11 per cent. of the cases (Loewy).

Results of Treatment.—In seven of the New Lodge Clinic series of 35 cases a thorough investigation showed that medical treatment was unlikely to be of any use, and an operation was advised after all septic foci had been eradicated. In each case the ulcer was excised and the normal anatomy restored by undoing the gastro-jejunostomy, as the X rays had shown that the pylorus was patent—a fact confirmed at the time of the operation. All the patients were completely relieved for a time, but two subsequently developed symptoms of ulceration after a dietetic indiscretion; in both cases the ulcer healed after further medical treatment. In one additional case, in which a gastro-duodenostomy had been performed at the same time, though not on my advice, a gastric ulcer developed six months later; after two and a half years of chronic indigestion it perforated, death occurring a few days after operation.

In five other cases it was expected that an operation would eventually be necessary, but a preliminary trial of medical treatment, together with removal of infective foci, was advised. Two of these improved so much that no operation proved necessary. In two cases, as no improvement occurred, the ulcer was excised and the normal anatomy restored; one of these remained well, but the other has had a further hæmatemesis following a dietetic indiscretion. The third had partial duodeno-gastrectomy performed, but his later history has not been ascertained, as he went abroad soon afterwards.

Of the 25 cases treated medically 13 were more or less completely relieved, and seven had further attacks of melæna or hæmatemesis with good health in the intervals. All but one of them had had hæmorrhages before they came to the Clinic. One patient, who had hæmorrhages at frequent intervals before admission and had undergone two operations since the original gastro-jejunostomy, had one hæmorrhage after a big dinner at which he drank a good deal of alcohol a few months after leaving the Clinic, but in the three and a half years which have elapsed since then he has remained free from symptoms. Only one patient gained no benefit; he should therefore undergo a second operation. In one additional case the digestive symptoms disappeared under medical treatment, but the patient died from Addison's disease, from which he was suffering at the time he was in the Clinic in addition to having a jejunal ulcer. No recent report has been obtained from the remaining three cases.

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REGIONAL ANÆSTHESIA AND INNERVATION OF THE TEETH.

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ORIGINALLY cocaine was only injected around the tooth to be operated upon, and its use was practically confined to extractions. With the introduction of regional anæsthesia, or the application of the drug to one of the main nerve trunks instead of to their terminal fibres, the scope of local anæsthesia was greatly enlarged. It was now practicable with a single injection to obtain a considerably larger area of anæsthesia than had been possible under the old technique, and as the injection was made into looser tissues it was much less disagreeable to the patient. The substitution of novocaine for cocaine was another distinct advance, as it abolished many undesirable sequelæ. This improvement in the technique of local anæsthesia has been the cause of its increased use by the dental surgeon, who now employs it for many conservative operations, particularly the excavation of carious cavities. One apparently insurmountable difficulty has been, however, that in many cases the dentine is not completely analgesic or the pulp is acutely painful. Of the many references, we quote a few dealing with the lower teeth.

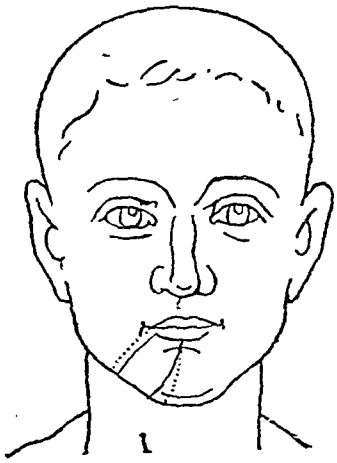
F. St. J. Steadman, in his excellent book on the subject,[4] discussing injections into the inferior dental nerve, says:—

"A curious phenomenon occasionally met is that the pulps of the molars are too sensitive to extirpate after a

mandible injection, although the teeth may be painlessly extracted. No satisfactory explanation has been offered."

He also states that an injection into the inferior dental nerve is only effective for operations as far forward as the first bicuspid tooth. This is, he says, because the nerve of the opposite side sends fibres across the middle line as far as the region of the canine. H. M. Seldin [3] has pointed out that, although judged by numbness of the lip and tongue, the tooth may appear to be perfectly anæsthetised, yet the dentine and pulp may prove sensitive. He suggests that the sympathetic nerves may carry sensory impulses, and as they run along the blood-vessels they may escape the anæsthetic. There is at least one grave objection to this explanation in the case of the inferior dental nerve, for the artery lies so close to the nerve that it would appear to be impossible for the anæsthetic to act on one without affecting the other. F. L. Platt [2] has seen cases of regional anæsthesia in both jaws, in which anæsthesia was apparently profound in all the superficial tissues, yet no dental operation, other than extraction, could be performed. R. Bragg [1] states: "I find that conservative cases do fail, even when academically perfect and there is perfect bone anæsthesia."

FIG. 1.

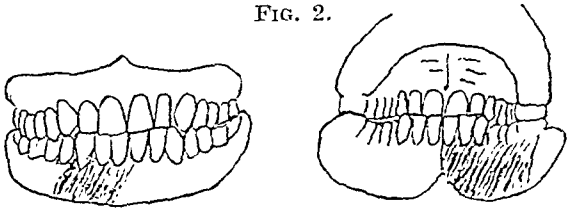


Problem of the Sensitive Pulp.

It will be seen that an apparently successful anæsthesia of the dental nerve is apt to give disappointing results. The tooth may be extracted without any trouble, but it may be impossible to work on the dentine, or the pulp may still be acutely sensitive.

In operations on the lower jaw, where the inferior dental had been apparently successfully anæsthetised, we found, like our predecessors, that we were usually able to excavate the dentine without any inconvenience to the patient, but the pulp was generally painful, but less so than without an anæsthetic. Frequently it was not painful as long as no stimuli were applied, and even with certain forms of stimuli, such as heat, cold, or pressure with cotton-wool, no reaction was obtained. Any attempt to pass a sharp broach into the pulp chamber brought on severe pain. Whether the diminished sensibility was due to some dissociation of sensations, or merely to a diminution of the power of reaction of the pulp, we are not prepared to say.

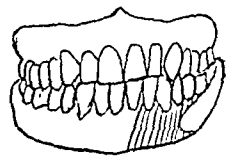
FIG. 2.



A B

There appeared to be two solutions of the problem: either the technique for injecting the anæsthetic was faulty and thus gave varying results, or the nerve-supply to the pulps of the teeth must come from other sources than the dental nerves. In the earlier stages of this research experiments were performed on the teeth of both jaws, but after a short time they were limited to the lower. The reasons for this were two: in the first place, the nerve-supply of the lower teeth is relatively simple, as there is only one dental nerve on each side; secondly, the lower dental nerves are much more accessible than the upper. We employed the usual standard technique for injections of the inferior dental nerve; 1·5 c.cm. of solution were deposited between the internal pterygoid muscle and the ramus of the mandible, at the point where the nerve enters the bone. Generally, the lingual nerve became anæsthetised simultaneously, but if this had not occurred, a further injection of 0·5 c.cm. was deposited in the lingual nerve, the needle entering the tissue on the inner aspect of the ramus at the level of the occlusal surfaces of the lower teeth. When the long buccal nerve required blocking, a further injection was made of 0·5 to 1 c.cm. in the sulcus midway between the cheek and the bone at the level of the roots of the molar, thus catching the nerve as it left the cheek. The success of this technique was controlled by an examination of the sensibility of the skin of the face and of the mucous membrane of the mouth. This was considered to be of the utmost importance, as it gave precise comparative information of the amount of anæsthesia, and showed exactly which nerves had been injected. On the skin the areas insensitive to light touch and pain were mapped out. For testing light touch a few strands of cotton-wool were used, and for pain the prick of a needle. In the mouth, however, it was very difficult to distinguish the areas insensitive to light touch on account of the shape of the cavity and the dampness of the mucous membrane; sensitiveness to pain only, therefore, was tested.

FIG. 3.



Case 23 (Figs. 1 and 2) provided a very typical example of the anæsthetic areas which are found after an injection into the inferior dental nerve. The two areas marked on the skin of the face by a continuous and a dotted line represent the parts insensitive to prick and light touch respectively. These areas extend from the edge of the lips above to a varying distance below, although they do not generally extend very far on to the submaxillary region. Anteriorly they approach the mid-line, although in most cases they do not quite reach it; posteriorly, they terminate near the angle of the mouth. The mucous membrane of the mouth, which becomes continuous with the skin above, is also insensitive. The two areas for touch and prick do not necessarily correspond, though in a certain number of cases they do. Of 15 cases in which we have the records of these areas, they were coincident in six. Fig. 2 is a standard diagram which we have used for plotting areas within the mouth: (*a*) is for the buccal side of the mouth, while (*b*) is for the lingual side, the shaded area indicating the part insensitive to prick. In this figure, which is also plotted from Case 23, there is an insensitive area extending from the canine tooth to the middle of the central incisor of the opposite side. This represents the area supplied by the inferior dental nerve alone; at the edge of the lips it becomes continuous with the inferior dental area of the skin. In front the area crosses to the opposite side of the body and invades the region which should be occupied by the nerve of that side. This has been seen in quite a number of patients. Of 19 cases, 8 overlapped the middle line, 3 exactly reached it, and 8 did not extend as far. The actual distance to which the area extends over the mid-line varies, but we have not seen it go beyond the lateral incisor. Of 18 patients, only 4 showed this phenomenon in the face areas. Either of the following hypotheses would explain it: the mid-line of the body may not correspond exactly with the mid-line for the nerve, or impulses other than pain may have elicited a response, so that the condition could be explained by simple dissociation and overlap.

Behind the inferior dental area there is a portion of the buccal aspect of the gum which is not anæsthetised; this is supplied by the long buccal nerve, and it is the distribution of this nerve which is responsible for the variation in the posterior limits of that area of the mucous membrane which is solely supplied by the inferior dental nerve. In Fig. 2A the area of the long buccal nerve extends as far forward as the space between the first bicuspid and the canine. The extent of the gum supplied by this nerve varies, however, in different individuals; it may extend as far forward as the middle of the canine, or only to the anterior border of the second molar. We believe that its distribution in the gum varies as in the superficial tissues, and may often run farther forward. Another arrangement quite commonly found is shown in Fig. 3, where the area for the inferior dental nerve extends backward for a varying length in its upper part and separates the long buccal area from the gingival margins of the teeth.

FIG. 4.

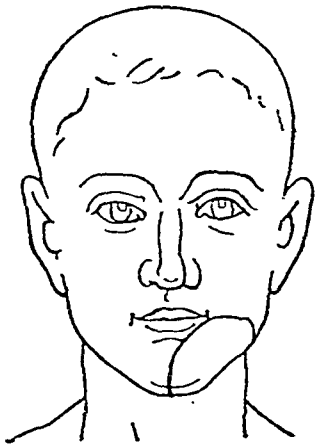


Fig. 2 B shows the distribution of the lingual nerve to the inner side of the gum. The anterior limit of this area also varies; quite frequently it ends at the mid-line of the mouth, but often further back; in one case it only came as far forward as the canine. This condition can, of course, be explained by overlapping from the opposite side. We have, once or twice, seen the area solely supplied by the lingual nerve trespass over to the opposite side of the mouth.

By mapping out these areas we could find out exactly which nerves had been affected by the anæsthetic, and could also get a very fair idea of its efficiency.

The next problem was, how sensations pass to the brain when the inferior dental nerve has been effectively anæsthetised. Although the long buccal nerve is said only to supply the outer alveolar plate and the lingual nerve the inner plate, it seemed possible that either or both of these nerves might send fibres to the teeth. Starkie and Stewart, in some unpublished work, have shown that the plexus in the mandible is far more complicated than is generally supposed, as it forms a network which ramifies over a large area; this plexus might receive twigs from the branches which supply the alveolar plates. In two of our cases, in which the pulps had been successfully removed, the area of the gum supplied by the long buccal nerve had been anæsthetised. In these two, as in practically all our patients, the lingual nerve had been anæsthetised along with the inferior dental.

We now chose a suitable case for further investigation. This was a youth, aged 17½ years, who had a large coronal distal cavity in his second left bicuspid tooth. An injection was made into the inferior dental nerve and after an interval of three minutes the patient said that his lip had begun to tingle. Excavation of the cavity was now commenced, and the patient complained of slight pain. After the decay had been removed, the pulp was found to be exposed and the upper wall of the chamber was removed. The patient still stated that the pain was only slight and not like that of an exposed nerve (of which he had had several). The long buccal nerve was now injected, and very shortly afterwards the pain ceased. The pulp was removed without any discomfort. Before the long buccal was injected, the normal area of skin supplied by the inferior dental nerve was analgesic. After the buccal injection most of the cheek was anæsthetic. It is to be noted that the lingual nerve was injected along with the inferior dental.

The second case which we desire to quote is that of an adult female who had a distal cavity in the left lower canine. The patient complained of intermittent pain. An injection was made into the inferior dental nerve, and the lingual nerve was successfully avoided. Tingling of the lip was felt five minutes after the injection. As the patient was very nervous and showed signs of collapse examination was postponed. There was no pain until the pulp chamber had been opened out, when the patient had acute pain, which ceased when manipulations were stopped. There was no pain when simple pressure was applied to the pulp. The patient had now become calmer and the areas of anæsthesia were marked out (Figs. 4 and 5). It will be observed that only the inferior dental has been anæsthetised, and that the long buccal area extends as far forward as the centre of the canine. The long buccal nerve was now injected, but the pulp was still sensitive. The lingual was injected and all sensibility in the pulp disappeared. A barbed broach was passed right into the pulp and the tissue was removed without any trouble.

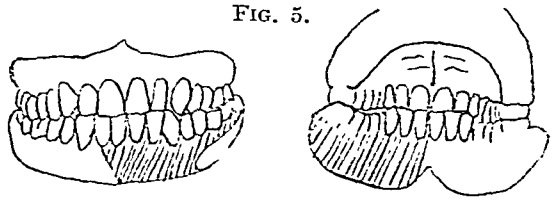
This case has several interesting features. In the first place, it shows that the pulp may be supplied by both the lingual and long buccal nerves. Secondly, it suggests that the usual explanation of the failure to anæsthetise the pulp in the canine—namely, overlap from the opposite side—may not be the only one. The cause may be additional nerve-supply from the other nerves of the jaw. This agrees with our own observations and with those of Starkie and Stewart, that overlap does not normally extend further than the lateral incisor. The fact that the long buccal nerve is sometimes anæsthetised along with the inferior dental nerve is probably due to the occasional incorporation of fibres of the long buccal nerve with the inferior dental as far as the inferior dental canal.

On account of the limited time at our disposal for this work and a certain amount of difficulty in obtaining the right type of patient, the number of our cases is at present small, and therefore our results are to a certain extent provisional. Up to the present we have eight cases in which the residual sensibility after injection of the inferior dental nerve was completely removed when the lingual and long buccal nerves were injected, and three cases in which the three nerves were simultaneously anæsthetised by the injection and the pulp removed painlessly. We intend to dissect the long buccal and lingual nerves to see if their branches can be traced into the dental plexus.

Summary.

This paper contains an account of an investigation into the causes of the residual sensation found in the pulps of teeth after injection of the inferior dental nerve. Evidence is brought forward to show that this is due to the supply to the pulp of fibres from the long buccal and the lingual nerves, and that if they are effectively blocked the residual pain will disappear.

FIG. 5.



A B

We acknowledge indebtedness to the Dean and the Board of the Victoria Dental Hospital, Manchester, for facilities for carrying out this investigation. To Prof. J. S. B. Stopford our thanks are due for his encouragement and helpful criticism. We are indebted to Mrs. Stewart for her assistance in preparing this paper for the press.

References.—1. Bragg, R.: Brit. Dental Jour., 1926, xlvii., 871–874. 2. Platt, F. L.: Dental Cosmos, 1926, lxviii., 805–810. 3. Seldin, H. M.: Ibid., pp. 793–795. 4. Steadman, F. St. J.: Local Anæsthesia in Dentistry, London, 1923.

Clinical and Laboratory Notes.

A NOTE ON STRANGULATED INCISIONAL HERNIA.

By HAMILTON BAILEY, F.R.C.S. ENG.,
GILLSON SCHOLAR, SOCIETY OF APOTHECARIES; SURGEON, DUDLEY ROAD HOSPITAL, BIRMINGHAM.

INCARCERATION of an incisional hernia is a dangerous and inaccurate diagnosis. Small intestine is nearly always a constituent of the sac contents, and, probably because the intestine has been entangled in adhesions for a considerable time, the symptoms of acute obstruction are to some extent masked. These patients appear to tolerate the toxæmia of intestinal obstruction in a remarkable manner, whilst gangrene proceeds apace in the sac.

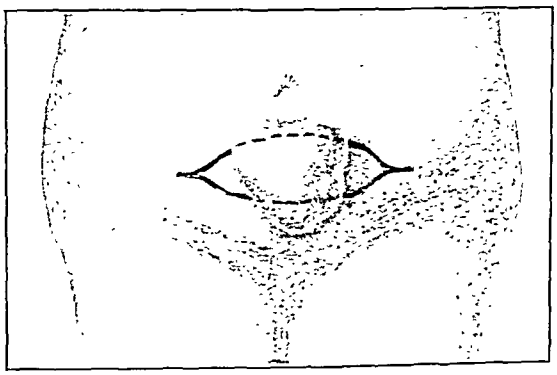
A woman of 58 had a strangulated incisional hernia; 35 years previously Lawson Tait had performed ovariotomy. Five days before I saw her the hernia had become more prominent and painful. During the whole of the five days she had vomited but once, and that was at the commencement of the attack. Her pulse-rate was 80, and the temperature 99° F. On examination the skin over the hernia was acutely inflamed and surmounted by a gangrenous patch. Around the hernia there was commencing spreading cellulitis of the abdominal wall.

At operation the sac was found to contain a coil of black, perforated intestine. The gut was resected, and end-to-end anastomosis performed. A large part of the abdominal wall sloughed.

She died two months later.

Other, almost as striking, examples of the masking of the signs of obstruction have been noted in this

FIG. 1.



Incisional hernia, Type 1.

series of cases of strangulated incisional hernia. As a general rule, it may be said that conservatism in these cases usually spells disaster. The mid-line

No.	Sex and age.	Previous operation.	Contents of sac.	Method used.	Result.
1	F., 52	Gynæcological.	S.O.	1	R.
2	F., 52	"	S.*	2	D.
3	F., 77	Gall-stones.	S.O.	2	R.
4	F., 69	Gynæcological.	S.	2	R.
5	M., 22	Appendicectomy (Battle).	S.O.	1†	R.
6	F., 46	Gynæcological.	O.	1	R.
7	F., 58	"	S.*	1	D.
8	F., 50	"	S.O.	1	R.
9	F., 56	"	S.	1	D.

S. = small intestine. O. = omentum. R. = recovered. D. = died.
* Gangrenous. † Vertical.
Methods 1 and 2 refer to types described in text.

lower abdominal incision certainly appears to be the most potent cause of incisional herniæ which strangulate (see table).

Operative Treatment.

The table gives an analysis of the cases of strangulated incisional hernia upon which I have operated. The large preponderance of cases in which the original operation had been a gynæcological one is striking.

For purposes of operative treatment incisional herniæ may be usefully divided into two classes: 1. Those with a reasonably defined neck. 2. Large multilocular.

Type 1 may be considered as similar to an umbilical hernia. The transverse elliptical incision around the

FIG. 2.

Incisional hernia, Type 2.

hernia may be used with advantage. After the sac has been removed, and the obstruction relieved, the abdominal wall can be repaired in a manner similar to that of Mayo's operation, to which the end-results are comparable.

Type 2.—On careful palpation it will usually be found that one loculus is more tense and tender than the remainder. A vertical incision over this loculus should be made with great care, for, as often as not, after the scarred skin has been incised it will be found that only a veil-like sac separates the scalpel from a tense loop of intestine. In this type of case one must be content to relieve the obstruction, making no attempt to repair the hernia. In certain cases repair of the abdominal wall may be undertaken at a later date.

GANGRENOUS APPENDICITIS IN A NONAGENARIAN.

By J. ALLAN BERRY, M.S. DURH., F.R.C.S. EDIN.,
MEDICAL SUPERINTENDENT, NAPIER HOSPITAL, NEW ZEALAND.

ACUTE appendicitis in the aged is not common, although cases occurring at the ages of 75 years[1] and at 80 years[2] have been recorded. The following account of acute appendicitis in a Crimean veteran who fought on the Jeanne d'Arc at Sebastopol constitutes a record as far as I can learn. His naval papers showed that he would be 90 years of age in May, 1927.

The patient was admitted to the Napier Hospital from the Old Peoples Home, at Park Island, on Dec. 7th, 1926, suffering from acute abdominal pain which he himself diagnosed as being due to appendicitis. He stated that 20 hours previously, while straining at stool, he "felt something drop" in his right iliac fossa and was seized with acute abdominal pain. This pain had persisted without cessation and had localised to the right iliac fossa. He had had difficulty in passing urine for the same length of time. On palpation a tender mass was felt in the right iliac fossa, and on rectal examination there was tenderness on the right side. Examination of his urine showed a small amount of albumin, some blood, and a few hyaline casts. He had a leucocytosis of 15,400. His temperature was 98·0° F., the pulse-rate 88, and the respirations 20.

[1] Forster, F. C.: Brit. Med. Jour., 1925, ii., 479.
[2] Metcalfe, B. B.: Ibid., p. 581.

A muscle-splitting operation was performed under a local anæsthetic. The cæcum was œdematous and the appendix was found to be lying over the brim of the pelvis and surrounded by adhesions. The appendix was removed, the stump ligated, and a purse-string suture used for inversion. A tube was inserted into the pelvis for drainage. He stood the operation remarkably well. The appendix was found to be gangrenous and to have perforated near its base and also about half-way towards the tip. The drainage-tube was removed on Dec. 10th, about which time he developed chest symptoms and coughed up a quantity of dirty yellowish sputum. The chest condition improved, and beyond some slight cystitis he made an uneventful recovery and was discharged well on Jan. 4th, 1927. He is still living and suffers only from constipation and bronchitis. The operation scar has remained sound.

It is interesting to note that, in spite of a gangrenous appendix, the pulse and temperature were normal on admission to the hospital.

Medical Societies.

INTERNATIONAL SOCIETY OF MEDICAL HYDROLOGY.

ANNUAL MEETING IN ENGLAND.

THE first session of this meeting was held in London on Oct. 10th, when Sir HOLBURT WARING welcomed the delegates on behalf of the Vice-Chancellor of the University. When London had a permanent school of post-graduate education, he said, one of the subjects taught would undoubtedly be medical hydrology.

Dr. ALISON GLOVER conveyed the greetings of the Minister of Health and the Government, and said that he firmly believed in hydrology, both as preventive and curative. In no department was the international spirit more necessary, and this country had much to learn from its guests.

Lord DAWSON OF PENN was elected President and took the chair, after which Dr. C. W. BUCKLEY (Buxton) opened a discussion on the relation between

THE STATE, THE HEALTH RESORT, AND NATIONAL HEALTH INSURANCE.

Great Britain, he said, had lagged behind many continental countries in State ownership or control of health resorts. Spas furnished the best methods of treatment for rheumatic diseases, but their resources were inadequate and until recently they had been ignored by the Government and regarded rather as the playgrounds of the wealthy than the sanatoria of the nation. Necessary funds could only be obtained by high fees and aid from local rates, and bathing establishments were saddled with all the drawbacks of trading concerns. The difficulty could be partly overcome by extension of insurance benefits, but an ideal scheme demanded that spa treatment should be available for the uninsured also. A special contributory scheme should make possible not only spa treatment but also holidays adequate to prevent premature breakdown. The natural advantages of small health resorts should be developed, as they might be more beneficial than large centres to the neurasthenic and the sufferer from early arteriosclerosis. If poor patients were admitted to the same spas as the wealthy, any tendency to lower the popularity of the place with the rich would be combated by its increasing fame, as the skill and experience of medical practitioners would be highest where the number of patients was greatest. The local profession ought to organise team-work, and courses of instruction in physiotherapy could be arranged in the great mineral water hospitals. A diploma should be necessary before doctors were regarded as qualified to practise in spa work. There were three possible ways of organising the health resorts: (1) State organisation and control of small spas for poorer patients; (2) utilisation and development of spa hospitals for more serious cases and supplement of their income from approved society funds; (3) the establishment of clinics to provide medical care and research facilities for patients able to pay their own expenses. A State central bureau would be required to coördinate the scheme and financial aid would be necessary at the outset. Hospitals would be the best channel through which patients could make use of the facilities, since a municipal scheme would tend to bureaucracy and the approved societies could only deal with insured cases. The spa practitioners' group of the British Medical Association provided an ideal means of coördinating the profession to organise and influence the scheme. Teaching facilities should be arranged in connexion with the spa hospitals, and specialists in hydrology should be available in various centres.

Spa Work in Germany.

Dr. MAX HIRSCH (Berlin) described the part taken by health resorts in the development of health insurance in Germany. Private societies to run seaside hospitals for children had been followed by holiday colonies and forest sanatoria. The latter were open-air day schools near the town and were also maintained by private enterprise. Spa treatment and child welfare measures had developed on a large scale during and after the war, but hydrotherapy for soldiers dated from 1825. Insurance had been established in 1881, had been greatly extended since the war, and more than half the population were now insured. Natural mineral water cures were allowed to their members by all the great insurance societies, and the results of spa treatment had been exceedingly good. Insured patients took their cure more seriously than the uninsured, and stayed at the spa on an average 35 days. It had become more and more evident that cures in health resorts were no luxury but an important prophylactic and therapeutic factor in public health. Synthetic products were so much less effective than natural waters that the more expensive "natural" cure paid for itself by shortening the illness. Spas were being used increasingly for heliotherapeutic treatment of surgical tuberculosis. The State insurance institutes had erected numerous hospitals, sanatoria, and convalescent homes, with a total of 2800 beds.

Dr. ETIENNE then described the work at the German State spa at Bad Elster, of which he is director. The insured or poor patient, he said, obtained accommodation and treatment at reduced prices, and there were a number of homes in the spa, maintained by the State, for different classes of patient—e.g., employees, civil servants, nurses, and ex-officers—and furnished according to the social status of the inmates. Invalids went to hospital. Great care was given to the diet, which was that of the average German family of the official class. A home with less than 40 beds did not cover expenses. The charge made in the "social" homes was M.8.10 per day per person, and the average course was ten mud baths and five mineral baths. The system of having two classes of bathrooms was a bad one, as the mere fact of having to bathe in an inferior room was prejudicial to treatment. All the spa physicians and the railways reduced their fees to patients to whom the spa administration had granted a cure reduction. If the insurance organisation did not appoint a "confidential physician," patients were allotted to the spa doctors in rotation. The 1927 figures for Bad Elster showed a revenue of M.247,855 from the cure tax and of M.528,190 from the baths. The sum to be deducted for *aided patients* was M.93,418.

The Spas of France and Italy.

Dr. R. GLÉNARD (Vichy) described French legislation governing medicinal waters. It was complicated by the fact that some springs belonged to private owners, some to municipalities, and some to the State. More and more, public interest was replacing private rights, and recent amendments dealing with the collection, testing, exportation, and sale of the waters and the management of treatment establishments gave every possible guarantee of purity. The legal safeguards

were operated by scientific and administrative bodies. Special local taxes were authorised to provide financial resources. The poor had been able to obtain free mineral water treatment since 1796.

Prof. U. GABBI (Parma) said that there were about 700 spas in Italy yielding various waters, many of them radio-active. There was no uniform public health system, but each town had a "cure committee" of which one member at least was a doctor. The committees were governed by a central council in Rome, which authorised the public use of spas after thorough investigation. At certain important centres there were institutes of physiotherapy and research. The poor were granted special travel facilities and arrangements were made for workmen and trade-unionists to enjoy spa treatment. In some spas there were sanatoria for the poor, supported by the local authority or by charity. The "cure tax" was divided among the communes and the National Society for the Protection of Children and Mothers.

Sweden, Czecho-Slovakia, and Roumania.

Dr. G. KAHLMETER (Stockholm) said that there was no State health insurance in Sweden, but about 13 per cent. of the population belonged to private sick clubs, which did not, however, allow hospital benefit. There was a compulsory "old age and disablement insurance" scheme for everyone, and of about 375,000 of its pensioners some 35,000 were incapacitated by chronic articular rheumatism. Pensions to the sum of 5 million crowns annually were paid, and the Board had therefore adopted prophylactic measures, partly in three special institutions and partly at the small spas. Medical, nursing, massage, and dental aid were provided for the pensioners and two-thirds of the expenses were paid by the Board. After treatment 70 per cent. of the neuritic and 67 per cent. of the arthritic patients were able to earn their living. Arrangements had recently been made with hospitals to provide treatment for febrile patients and late cases requiring orthopædic care, but there was at present no provision for ambulant treatment.

Dr. L. SCHMIDT (Pistany) said that the spas of Czecho-Slovakia were enormous hospitals, ideally laid out, and were used by large numbers of the population. It was the duty of the State to see that the hygiene and research work of the spas was kept at a high level, and to fulfil this a balneological institute was to be erected. The State had the right to acquire treatment for its poorer citizens. The health insurance organisations had not yet fully realised the economic value of spa treatment.

The meeting then took as read a paper by General VICOL (Bucharest) describing the balneological organisation of Roumania, which dated only from 1924; the post-war reorganisation had restored to the country a great wealth of mineral springs, which the new law divided into larger and smaller. Important obligations were laid on the former, which numbered 25. In addition, there were 28 springs giving a variety of natural mineral waters. All watering, climatic, and tourist resorts were controlled by the Ministry of Health, and scientific work by the University Balneological Institute. Spa doctors were obliged to take a diploma. The State owned and ran a few health resorts to serve as models for the others, to regulate their prices, and to serve research and medical education. National health insurance covered most of the workers, but the intelligentsia and civil servants were not well organised. The Railway Labour Institute had done fine work and had erected sanatoria at the principal health resorts, and sent several summer colonies of tuberculous patients to the mountains. The Central Insurance Office also had three institutions in health resorts and three sanatoria; it had sent 3052 insured persons to health resorts.

Dr. JOHN MURRAY (Llandrindod) emphasised the tremendous importance of rheumatic diseases to the wage-earner and the State. Great Britain ought to have a scheme ready to enforce at once. To put chronic patients in a hospital was not giving them their best treatment, and a great deal of privacy and cheerfulness was needed for the average worker. This could be provided by approved lodgings. Speed was essential, and if the State would put down 2 or 3 million the scheme would go ahead and become a paying concern.

Dr. KERR PRINGLE (Harrogate) said that mineral springs must be recognised as public property, and be assisted by the Ministry of Health. The springs should be leased to the local authority at a small rental so long as essential hygienic conditions were fulfilled; a ring of 10 to 12 miles round the spa should be freed from noise, noxious industries, and all features inimical to health. Improvements should be made easier; at present a Bill was necessary. Spas should not be subservient to county councils. The advantages of State control outweighed the disadvantages.

At the session on Oct. 11th the subject of discussion was the

HUMORAL FACTOR IN DISEASE.

Dr. M. B. RAY (London) read the opening paper, reviewing the historical aspect of the subject. The humoralistic hypothesis, he said, dated from the *De natura hominis* of Hippocrates, wherein the theory of the four cardinal juices (blood, phlegm, black and yellow bile) was laid down dogmatically. Earlier philosophers had assumed that the human body was made up of four elements corresponding with the four primary substances; in the Hippocratic scheme the heart-blood was "warm moist," the yellow bile from the liver "warm dry," the black bile from the spleen "cold dry," and the phlegm secreted by the brain "cold moist." Health depended on the due balance of these juices, which were renewed by the food. Faulty admixture or abnormal accumulation caused disease. Outside influences, such as the seasons, affected the blending of the humours. In the spring blood predominated, in the summer yellow bile, and in the winter phlegm—as evidenced by colds. Galen's modification of this system could be made to fit any phenomenon. His therapeutics were founded on a concept of disease as a disorder of function, and one of the principal methods to be used was the expulsive, to evacuate noxious substances. The final blow to the general acceptance of the humoral theory was given by the recognition of Harvey's work on the circulation. The seventeenth and eighteenth centuries were marked by great striving after the formulation of physiological systems of medicine, and de Borden (1722–1776) had actually foreshadowed a "hormonic" theory. After a period during which clinical medicine had been based on the "static" revelations of pathological findings, the work of Virchow and Cohnheim and the later researches on internal secretions had shown that many diseases were only secondary results of metabolic disturbances or blood disorders. Fever, for instance, had to be regarded as a condition instead of a "substance," a thing in itself. The ancient idea of "purging the humours" found a modern application in the treatment of body fluids by eliminative measures which formed a substantial part of hydrotherapy. "Neohumoralism" implied a concept of disease as primarily due to changes in the body fluids, producing a dissociation of the functional unity of the organism considered as a whole.

Dr. P. FERRYROLLES (La Bourboule) related the humoral factor with spa treatment. Waters, he said, were useful almost exclusively for chronic diseases. Their manifestations depended upon humoral disorders: (*a*) of endogenous endocrine origin; (*b*) of exogenous toxic origin; (*c*) due to alimentary autointoxication. If the action of waters were better understood the origins of morbid humoral states would also be better known. How did kations of waters influence the kations in the body fluids? Waters operated by the infinitely little. The introduction of an electrolyte might overturn micelles and provoke a gel; demineralisation might change the

constitution of an albumin. A water might supply elements indispensable to the colloidal suspension of proteins. Lipoids fixed neurotoxic poisons. Lipoids were only mobilised in the body-fluids in a colloidal solution of soap; soaps were readily dispersed by waters. Therefore mineral waters were most powerful agents for the cure of chronic diseases.

Principles of Neohumoralism.

Dr. A. P. CAWADIAS (London) spoke of the present medical era as one of neo-Hippocratism, or neo-humoralism, as constituted by three principles: that of vitalism, that of ætiological integration, and that of pathological integration. According to the second of these the body was the unit, and no modification of any cell could be regarded as without effect on the other cells. In the course of development the chemical induction and irritability, originally common to every cell, became concentrated in the endocrine and nervous systems respectively. In man the integrative mechanism was triple—neuro-endocrino-humoral. The body being integrated as a whole, disease must also be conceived in terms of integration. The whole organism became diseased; there were no diseases of organs, tissues, or cells. Disease was a disharmony of life, a defect of adaptation, an irresponsibility to external conditions. These conditions acted through the integrative mechanism of the body, especially the nervous system. Diagnosis thus became triple: of local "disease," of personal functional conditions—to what extent the individual was injured by his complaint—and of ætiological combinations, the conditions which had brought about this "insufficiency of the person." Clinical examination and intuition were re-established in diagnosis, and treatment was founded upon a "constellation of causes." This meant that the specialist outlook was reserved for the surgical branch only. Specialisation in diagnosis was impossible. The scope of treatment was also widely extended. Chronic rheumatism, regarded as a lesion of the joints, could only be treated surgically; as a microbic effect only by antiseptics and extirpation of infective foci. But if we regarded it as the result of a defective reaction of the neuro-endocrino-humoral integrative mechanism toward a constellation of environmental conditions, we might, by acting through other external forces, create a good environmental constellation and re-establish the normal response of the mechanism. The dynamic point of view was being introduced into medicine.

Prof. E. H. KETTLE (London) stressed the particular affinity of certain micro-organisms for certain organs or tissues. The lesions of almost every group were so strikingly characteristic that it should be possible to find a much more rational therapeusis. Devotion to the humoral aspect of morbidity had done little to reduce the mortality tables, because the blood could not give an adequate picture of the effect of the invasion on the tissues most affected. Blood changes were often of great importance, but many of them were purely secondary and not vital. The question of infection depended entirely upon the tissues and not upon the circulating plasma. It should be possible to modify the process of infection by modifying the condition of the tissues involved, and the best results should be expected from a régime influencing the body as a whole. We had not, however, reached the time when we could disregard the results of infection in the body and devote ourselves to the consideration of a hypothetical complex.

Prof. A. DE M. SARMENTO (Coimbra) said that hydrology as it passed from a practice to a science could not remain a stranger to the doctrine which saw the origin of certain diseases in the fluids of the body. Humoralism had survived heavy blows, and the humours—as cradles of the hormones—were inexhaustible sources of pathological possibilities. Life demanded a certain proportion between the sodium, potassium, and calcium of the blood, and various other electrolytes played a part in metabolic processes. At the spa of Vidago, Portugal, he had found it essential to adapt his hydrological prescriptions to the humoral personality of the patients. For acidosis, waters were prescribed according to the electrolyte reserve of the blood, the pressure of carbon dioxide in the pulmonary alveoli, and the ammonia and sodium phosphate in the urine. For cholecystitis, whether with stone or not, the water was introduced directly into the duodenum, and in hyperchlorhydria indications were given by the hydrogen-ion concentration of the urine. The humoral factor allowed a rational interpretation of the genesis and course of morbid conditions; humoralism gave amplification and precision to the indications of therapeutic hydrology. The subcutaneous route was preferable to all others for securing the desensitising and "phylactic" action of mineral waters.

Dr. E. P. POULTON (London) spoke of the value of H. A. Ellis's work on the acid base equilibrium, and described an investigation by Dr. E. Obermer and himself of the urine in rheumatic patients. In a typical periarticular rheumatoid arthritis with marked wasting, the diurnal curves showed that the calcium loss was very high and that free acidity almost completely disappeared. The combined acidity was less reduced, so that the ratio between them became less than 1 : 2 and might be 1 : 4 or 1 : 5. The creatinine excretion was low, as would be expected where there was much muscular atrophy. The blood showed increased sedimentation and hydræmia, while the hæmoglobin, blood-calcium, and cholesterol were normal. The viscosity of the serum was high and there was an increase of serum proteins. In two cases the uric acid had been high but within normal limits, and in three there had been high acidity with high specific gravity and rather low volume. It was possible that this latter type of urine would prove to be associated rather with the osteo-arthritic case. An important point was the increase of sulphur, in all its forms, in the urine of these patients.

Dr. M. HIRSCH emphasised the importance of focusing attention on the patient—as did the Hippocratic school—and not on the disease.

(*To be continued.*)

ROYAL SOCIETY OF MEDICINE.

SECTION OF NEUROLOGY.

AT the opening meeting of this Section on Oct. 11th Mr. DONALD ARMOUR delivered a presidential address entitled

SOME CONSIDERATIONS ON HEAD INJURIES.

He said his main thesis was well represented by what John Bell wrote 125 years ago, to the effect that there was this encouragement to consider the pathology in place of the anatomy of the skull as the rule of prognostics that while anatomy and the enumeration and classification of fractures had led to an undue propensity to operation, the study of the living powers and the mutual dependence of these parts led to a reserved, modest, and rational practice, and to a careful and solicitous attention to all the insidious symptoms of an injured brain. Mr. Wilfred Trotter, in the present day, made a similar plea when he asked that in cases of head injury diagnosis and treatment should be kept in close association with pathology; and before attempting treatment the surgeon should make every effort to call up the clearest possible picture of the conditions within the skull of the particular patient. It was a pity that, even now, the subject of head injuries appeared in the text-books under the heading of "Fractures," resulting in a due consideration not being given to the functional or organic damage that the skull contents might have sustained. This was constantly shown by the early insistence, after head injury, on a skiagram of the skull being taken, as if the presence or absence of fracture were the most

important consideration, and as if this would give the best clue to the proper treatment. Indeed, it might constitute a pitfall in prognosis. There was also, Mr. Armour thought, a lack of appreciation of the importance of so-called "minor head injuries"; these might well become major at a later stage.

His main intention, therefore, was to direct attention to head injury without skull fracture. The commonest result of severe head injury was a general increase of intracranial pressure, brought about first by either reactionary œdema or hæmorrhage or both. It might be maintained or aggravated by interfering with the paths of absorption of the cerebro-spinal fluid. There was first a blocking of the cerebral subarachnoid spaces, so that the fluid collected in the basal cisterns and ventricles. The swollen brain, pushed up against the resistant dura, interfered still more with absorption, so setting up a vicious circle. Also there was direct pressure on the medulla of the fluid in the basal cisterns. Trotter said that the term "concussion" should be used to indicate an essentially transient state due to head injury of instantaneous onset; that it manifested widespread symptoms of a purely paralytic kind; that it did not, as such, comprise any evidence of structural cerebral injury; and that it was always followed by amnesia for the actual moment of the accident. But was it correct to say that concussion of the brain did not as such comprise evidence of structural cerebral injury? How was one to explain the onset and persistence of the post-concussion symptoms so often included under the term, which was a misnomer, "post-concussion neurosis"? It was easy to see that any sudden overfilling of the perivascular lymph space with cerebro-spinal fluid could cause laceration of a vessel by tearing its wall in the neighbourhood of a fibrillar attachment. Cassasa had suggested that sudden physical distension of the peri-ganglionic spaces by cerebro-spinal fluid caused, in cases of concussion, a direct physical change in the ganglion cell, which might explain all the phenomena of concussion of the brain; that the change might occur without minute hæmorrhages, and explained the complete negative findings at post-mortem examination in cases of concussion. Osuati and Giliberti, as a result of studying 100 cases of concussion, said that not only was there actual cerebral injury in concussion cases, but that in a few instances complete resolution did not occur; indeed, there was a strong likelihood that secondary degenerative changes developed. For these reasons those workers suggested, in place of "post-concussion neurosis," the term "traumatic encephalitis." In any case, Mr. Armour said, the symptoms usually following concussion were the expression of an altered pressure of the cerebro-spinal fluid, and an unstable pressure of it such as had been described in association with epilepsy. Mestrezat, Bouttier, and Logre found that 80 per cent. of a large number of concussion cases without head wounds showed definite changes in the cerebro-spinal fluid, chiefly an increase in tension and an excess of albumin. Those authors attributed this to an aseptic disintegration of nerve tissue without meningeal involvement, with a marked tendency to hypersecretion.

From a medico-legal point of view, the possible imitation of the "formula of concussion" in syphilis of the nervous system was a matter of great importance, so that when even a slight lymphocytosis was present a Wassermann test should be made. Claude, Lamache, and Dubar had investigated the cerebro-spinal fluid of patients with head injury but without skull fracture, very few of them having lost consciousness. The interval between receiving the injury and the fluid being examined varied from two or three weeks to several months. Relief was sought for such subjective symptoms as headache, dizziness, weakness, insomnia, tinnitus aurium, and visual fatigue. In only nine of 22 cases examined was there increased albumin, the excess tending to disappear as the symptoms subsided, following repeated lumbar puncture. The tension of the fluid, however, was altered in all except five of the cases.

Increased tension following slight injury might be due to such factors—acting either alone or in combination—as increase in the amount of the fluid secreted, interference with its circulation and absorption, variations in volume of the cranial contents (nervous, ventricular, and vascular).

The Effect of Trauma on the Choroid Plexuses.

The position of the choroid plexuses, said the President, rendered them particularly vulnerable to be affected by the direct action of a wave of repercussion at the time of the accident. Could such a trauma affect their secretory activity? Duret considered that trauma caused cerebro-spinal shock, tending to congest the brain mass and so produce intracranial hypertension—i.e., by lessening the cranial space, by venous stasis, and by the augmentation of the circulation, with increased flow of blood to the secretory organs (the choroid plexuses). There was also, probably, an irritation of the ependyma by waste products of disintegration in cases of minute pial hæmorrhages, and of post-congestion extravasations. In other words, hypertension could be attributed to hypersecretion of cerebro-spinal fluid. Leriche considered that the hypotension in head injuries resulted from the formation of a porencephalic cyst on the brain surface. The speaker thought several factors were responsible, such as a functional disturbance of the regulating centre for fluid tension, inhibition of the cells of the choroid plexuses, or local modifications of the cerebral circulation.

Following head injuries, there were changes in the shape and position of the ventricles. Block and Oppenheimer had made a comparative study of the intraspinal pressure, the blood pressure, and the intra-ocular pressure in cases of head injury. In all cases of skull fracture, though the blood pressure was below the average, the spinal pressure was above normal, and ocular pressure above the average. Their conclusion was that no individual parallelism existed between intraspinal pressure, arterial pressure, and ocular tension, but that, on an average, a high pressure of one type was associated with a high pressure of the other types. The same was true of low pressure.

Clinically, any attempt to estimate intracranial pressure in the light of general blood pressure findings was of no practical value. The initial shock following a severe head injury and lasting some hours, with the associated fall in the general blood pressure, would mask the true intracranial condition. Moreover, the intracranial pressure must reach a dangerous stage of compression before it could markedly increase the general blood pressure. Determination of the pressure of the cerebro-spinal fluid in head injury, both acute and chronic, was of undoubted importance, and it must be taken by a manometer. Ayer considered that normal pressure could be regarded as anything between 100 and 200 mm. of water; between 200 and 250 was "suspiciously high," and from 250 to 300 as definitely abnormal. The significance of blood in the cerebro-spinal fluid after head injury was often overrated; but it was a corroborative sign of intracranial injury, associated with bleeding from an intradural vessel. From the treatment standpoint the presence or absence of blood in the fluid was without importance. The important factor was the pressure of that fluid.

The Cranial Nerves after Head Injury.

Immediately after head injury, said the President, the pupils were dilated and were sluggish to light. Both conditions were increased during unconsciousness. The pin-point pupil in the early stage of supracortical hæmorrhage or œdema passed into dilatation as the stage of irritation passed into that of paralysis. Injury to cranial nerves occurred in about 12 per cent. of cases of head injury, usually in basal fractures. Varying conditions were concerned in the production of these paralyses of cranial nerves, the most frequent probably being injury of the nerve by bony compression. In some cases the cause might be compression due to a meningeal hæmorrhage.

He paid particular attention to the question of the effect of increased intracranial pressure in causing cranial nerve symptoms, especially what was termed by the French "papillary stasis." Cushing and Bordley showed how quickly retinal œdema could occur in certain forms of increased intracranial tension, especially after the introduction into the cranial cavity of fluid under tension, and how soon this disappeared when the tension was relieved. The amount of intracranial tension could be well estimated from an examination of the eyegrounds, as in head injuries with increased tension there might be papill-œdema proportionate in severity to the degree of the intracranial symptoms. Early signs were a dilatation of the retinal vessels (veins) with venous stasis, and a slight œdema. With increasing tension there was an œdematous blurring of the disc, possibly followed by the whole disc being obscured. Usually these changes did not take place within the first six hours.

The President entered a plea for the more frequent performance of lumbar puncture as a therapeutic measure in both acute and chronic head injuries; its value was not, in his view, appreciated as it should be in the profession. In mild cases of increased tension the slow withdrawal of fluid, repeated if needed, was of great value; it often allowed the postponement of an operation until conditions were suitable for it, or even might obviate it altogether. The pressure of the fluid was the determining factor. In cases not requiring decompression but suffering from severe headache, great restlessness, irritability, vertigo, &c., repeated lumbar puncture was an important mitigant. It was possible, as Weed and McKibbin had shown, to lower the pressure of the cerebro-spinal fluid by the intravenous injection of hypertonic solutions. Conversely, the brain mass could be increased by using hypotonic solutions. Fay found that the intestinal instillation of magnesium sulphate was almost twice as efficient as sodium chloride for the reduction of intracranial pressure. But over-dehydration might be serious, even fatal. For lowering intracranial pressure, Howe found that dextrose was quite non-toxic; it caused no disturbance of respiratory or cardiac action.

Dr. JAMES TAYLOR, as the doyen of the neurologists present, proposed, in a happily reminiscent speech, a cordial resolution of thanks to the President for his address, and this was seconded by Mr. GEOFFREY JEFFERSON (Manchester), and accorded by acclamation.

SECTION OF PATHOLOGY.

AT a meeting of this Section on Oct. 16th Prof. A. E. BOYCOTT gave a presidential address entitled

The Transition from Live to Dead: The Nature of Filtrable Viruses.

The natural view that live organisms were essentially different in their properties from dead matter had led, he said, to the endless controversy between vitalism and mechanism. If vitalism had had the best of the argument, it led to an unsatisfying position, often mystical and always dualistic. The mechanistic attempt to escape dualism and explain life by chemistry and physics had completely failed. The solution was to recognise the similarities rather than the differences between live and dead, and to regard the whole world as composed of units of varying complexity but inherently like one another. Recent progress in atomic physics had gone far in assimilating the behaviour of atoms to that of organisms. Instead of being stable and immutable it was now realised that the elements had a complex structure and went through processes of disintegration and reconstruction which were analogous to the life and death and evolution of live organisms. Especially was it now recognised that all matter and energy was discontinuous and existed in discrete units like live animals. In a world so arranged it was reasonable to expect to find units which were neither live nor dead in the ordinary meanings of the words; these intermediate things are represented by "filtrable viruses" and other similar "agents." These have the common properties of being very small (probably on the average about 0·025 μ in diameter), of unknown origin, incapable of independent life, and capable of some sort of multiplication. They seem to form a series grading from things which are plainly "dead" to things which are mostly "alive." The products of the autolysis of dead tissues stimulate growth of tissues and thereby potentially increase their quantity. Lysozyme would pass for an enzyme except that it is increased in amount by dissolving bacteria. The Rous sarcoma agent can hardly be called alive in view of the drastic treatment in separation and purification which it withstands; it is generated in the tumour and can be made to cause the growth of an indefinite amount of tumour tissue by dispersing it among animals, but like other viruses it multiplies only when it exhibits its specific activity. Similarly the bacteriophage probably originates from the bacilli with which it is associated; it increases in quantity only when the bacilli multiply. None of the viruses which cause disease in animals or plants has certainly been cultivated in the absence of cells though the technique necessary for this will probably be discovered. Normally they multiply only in the presence of live and usually growing cells, in the body, or in tissue culture. There is no evidence that the particles of virus which are obtained from an infected animal are the direct descendants of the particles which were used for inoculation, and it is possible, therefore, that their multiplication is indirect as it is with the products of autolysis, the Rous agent, and the bacteriophage. A virus, then, may be at once the cause and the result of a lesion, affecting cells in such a way that they produce more of it. The phenomena need to be interpreted on their own merits and not by analogy with bacterial diseases.

It is difficult to believe, said the PRESIDENT, that small-pox, for instance, is not usually caused by virus disseminated from a case of the disease, but herpes, to take another example, not only has no association with itself but has a definite connexion with certain bacillary infections, and it seems quite likely that the virus is constantly arising afresh. The rabbit disease due to virus III. is produced by inoculating one rabbit with a testicular emulsion of another rabbit and once started can be propagated indefinitely in series. Similarly, Murphy, Leitch, and Brebner have obtained the carcinogenic virus from normal tissues from which it is usually generated under the influence of some external stimulation.

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS.

ANNUAL CONFERENCE IN LONDON.

THE fourteenth annual conference of this Association was opened on Oct. 15th by the Hon. Sir ARTHUR STANLEY, who extended a special welcome to the Canadian delegates, and spoke of the "world war" now being waged against this terrible scourge.

Dr. R. G. FERGUSON (Director of Medical Services, Saskatchewan Antituberculosis League) read a paper on

Tuberculosis among the Indians of the Great Canadian Plains.

About 1884, he said, tuberculosis among the Indians had assumed the proportions of a serious epidemic. The acute phase had lasted less than two decades, but even now the death-rate was about 800 per 100,000. All varieties of the disease had existed, but adenitis had particularly affected all ages; death had been most usually due to pulmonary tuberculosis. Many acute cases had become chronic and recovered, the maximum fatal susceptibility having been under 5 years of age. 26·86 per cent. of the first generation had succumbed, 32·7 per cent. of the second generation, or generation of childhood infection, and 20·46 per cent. of the third generation, or those whose parents had been tuberculised before

fecundity. A study of 147 families traced through three generations had suggested that those who had died had been non-resistant to disease generally, rather than lacking in resistance to the specific bacillus. An infusion of white blood had appreciably increased the mortality of the children, although the morbidity did not appear different. Children entering school at an average age of 7½ were sensitive to tuberculin in 60 per cent. of cases, but between 11 and 15 years of age over 96 per cent. were sensitive. The type of disease developing among them was either a minimal local lesion or else a rapidly fatal infection. Those who succumbed would probably not have responded to rest and hygiene, but would have required prophylactic immunisation.

The epidemic was now on the wane, and the Indians had been generally tuberculised, although the mortality was still 20 times that of the surrounding white population. There had, however, been no loss of infectiveness or of virulence, as shown by the sensitivity of the school-children to tuberculin and the rapidity of 15 recent fatalities. The cattle were more or less tuberculised, only 7 per cent. of reactors having been found; until recently the Plains Indians had not consumed milk products much and had lived on buffalo meat. The bacillus in every one of 15 glandular specimens had been human. It was clear that resistance was an individual and not a family trait, and that those who survived belonged to families who were more prolific and more resistant to white men's diseases generally. In the process of civilisation just over every second family tree had died out within three generations, and practically all families had suffered from tuberculosis. Resistance far outshadowed other factors, such as food, housing, and sanitation. The most important predisposing factors were acute epidemic diseases, such as whooping-cough, measles, and influenza, and food appeared more important than housing. Food, housing, and sanitation had much effect on mortality but little on morbidity. The resistant type of Indian child responded as well as a white child to sanatorium treatment. The processes by which resistance had been increased were many, and included (*a*) elimination of the weak and unresistant; (*b*) infusion of resistant white blood by crossing; (*c*) sensitisation of soil in the third generation; (*d*) improved living conditions. Childbearing had no effect on the resistance of women. The surviving Indians were biologically strong, with a high birth-rate of healthy infants.

Dr. JOURDRAN then read a paper by Dr. J. J. VASSAL (ex-Director of Health of French Equatorial Africa) on

The Occurrence of Tuberculosis among Peoples in Equatorial Africa.

Dr. Vassal said that investigation of the ætiology of tuberculosis among the inhabitants of unexplored regions might open out new avenues and greatly increase our knowledge. The unparalleled mix-up of races during the war had exposed hitherto isolated peoples to infection of all kinds, and men of science had greatly profited by the lessons this "experiment" had taught. Primitive races, far from being immune to tuberculosis, were particularly sensitive, and climate, season, and latitude played a very small part in producing immunity. What counted was repeated vaccination in infancy, producing a chronic disease which conferred a state of resistance, if not an immunity. It had been established now that the general distribution of tuberculosis in the urban centres of Europe followed certain rules; 55 per cent. of children up to the age of 5 reacted to tuberculin cuti-reaction, and not more than one-tenth of adults had escaped contamination.

The mortality in Europe varied from 11·8 per 100,000 in Portugal to 15·9 in England, 22·6 in France, and 37 in Hungary. The big towns were twice as badly affected as the country. In America the mortality had been lowered from 195 in 1900 to 112 in 1920, but was still high in States where there was a large coloured population. In Asia tuberculosis was prevalent among Chinese, Hindus, and Japanese in about the same proportion as in Europe. Young women in India were extremely liable to tuberculous infection. The scourge was rare in the desert areas of Australasia, but assumed European proportions in the towns. In the Philippines in 1908 the death-rate was 486 per 100,000, and the Caroline Islands had been decimated by tuberculosis.

Africa was the most interesting of the continents. The countries which had long been open to commerce and civilisation were comparable with Europe, but the interior regions showed peculiar features. Tuberculosis in the French colonies had been investigated by the Pirquet reaction and the Calmette methods. In the old colonies the disease followed the same course as at home, but in those recently opened up there was a very strong reaction. The average incidence among adult natives in Algeria, Tunisia, and Morocco was 52·8 per cent., but in the oasis of Fiuguig and of the extreme south it was 22 and 26 per cent. respectively, falling to 18 per cent. for isolated desert tribes. Senegal had been occupied since 1626 and had long been recognised as a source of tuberculous infection; figures given varied from 12·5 to 35 per cent. for children, and tuberculosis was responsible for 23 per cent. of the general death-rate in the native hospital of Dakar in 1925–6. The return of black soldiers from France had constituted a grave danger. La Réunion was one of the oldest colonies, and the inhabitants gave a cuti-reaction of 81 per cent. The French Antilles were widely infected, about half the population giving a positive reaction. Thanks to Prof. Calmette, much work had been done in French Indo-China, where the infection among the dense population was heavy. The newer group of colonies included Guinea, the Ivory Coast, Dahomey, Mauretania, and the French parts of the Sudan and Nigeria. The figures available varied between 3 and 17 per cent. Dr. Jourdran himself had investigated the densely forested hinterland of Liberia and had encountered no case of tuberculosis among the indigenous population, although syphilis and malaria were rife. Madagascar was heavily infected, but the disease was rare in the Cameroons, although the people were very sensitive to it. In many of the French islands of Oceania tuberculosis was decimating the population, and the severity of the disease on any given island seemed to be proportional to the number of Europeans. In French Equatorial Africa, where the poor living conditions had greatly enhanced the virulence of all kinds of infection, tuberculosis had respected the populations already subjected to other infections and had not reached the interior. Where it had taken root it had spread with great rapidity. In the Belgian Congo Europeans showing signs of consumption had to leave within three months, in order to protect the natives. Experience of leprosy, dengue, and other infections had shown that any disease entering a new country for the first time acted in a special way. The resistance of a race was derived from hereditary factors fixed in the blood. Tuberculosis among black troops was to be compared with that of guinea-pigs and monkeys in the laboratory, and took a course like that of the disease in children. When primitive races came into contact with civilised ones an infection occurred, assuming first a short latent glandular phase, especially associated with supraclavicular enlargement, and a second dramatic miliary and caseating phase with pleural and massive abdominal lesions. It was independent of country, climate, and environment. It was probably quite impossible to prevent this contamination, though steps might be taken to postpone it. The only method of attenuating the danger at present was vaccination by the B.C.G. of Calmette.

At the afternoon session Prof. S. LYLE CUMMINS (Welsh Memorial Association), making a plea for

Preventive Medicine among Dependent Races,

said that Western Europe and America had adapted to the tubercle bacillus, just as they had to their climate and to life in urban aggregations. This was

manifest in the steady fall in tuberculosis incidence and mortality since the middle decades of the last century, and in the gradual tendency for the age-period of maximum incidence to fall. This adaptation had not taken place in Africa, Asia, and Eastern Europe. Prof. Cummins related his experiences in Africa, where he had seen the primitive aboriginal natives, free from tuberculosis in their isolated homes, fall victims directly they were recruited.

As in Europe there were fairly clear-cut differences in the clinical and pathological manifestations of tuberculosis according to age and sex, so in Africa and Asia there were similar differences according to the type of culture and to the degree and period of contact with Europeans. C. Roubier had called attention to this and correlated the disease of various racial groups with that of our age-groups. The former might be spoken of as "stages of tuberculisation," each stage implying a degree of adaptation and resistance. There was no more important question for an Imperial Government responsible for the guidance of numerous populations of varying cultural and racial types than this one of the degree of risk which each type ran under new and unfamiliar conditions of life.

The tuberculosis from which the native miners of South Africa suffered differed from that of the primitives and from that of Europeans. The former might be compared with our infantile tuberculosis, while the disease among Annamese and other peoples who had long been in contact with a rural civilisation was more like that which afflicted older children and adolescents with us. That of the South African miner was midway between the two.

The opening up of the mining industry had drawn all types of natives from all sources together, and they had been housed in dark, overcrowded compounds, believed by the owners to be no worse than the native kraals. The mortality from pneumonia, meningitis, and tuberculosis had been terrible, and those who had survived to return home had taken with them the seeds of endemic disease. The owners had, however, realised their responsibility, and also the economic value to themselves of ensuring the health of their workers. Experts had been invited to help in the fight, and the position had, in fact, been so revolutionised that now the native miners were healthier after their service than before. If they could be protected from bacterial disease they gained weight and returned richer in pocket and well set up and fit. The actual incidence of tuberculosis in the gold-mining industry was hard to determine, because the men worked on short contracts, and many must die untraced or become ill after repatriation. Incidence and mortality had undoubtedly fallen in recent years, and was now estimated as not much higher than among European mining populations. Those who succumbed, however, showed a much more generalised and formidable type of infection with less tendency to cavitation and fibrosis than was common in Europe. Yet this was not a "virgin soil" infection, as tuberculin-testing showed 80 per cent. of positives. The native population was more or less tuberculised, but nevertheless the infected healthy native was much more liable than the infected healthy white man to suffer from widespread fatal generalisation of his disease when he worked in mines, comparable with the galloping consumption of young agricultural workers over here who went to work in cities. This proved that he was less resistant than the South African of European stock, probably because the disease had not been endemic for more than 50 years or so. The facts suggested that the power of acquiring resistance to tuberculosis might depend on inherited factors. The returning workers did not heavily infect the kraal population because it was so scattered; perhaps only the immediate relatives would be seriously affected. Prof. Cummins ended with a plea for the native races, pointing out that within a few generations we should either be guilty of the deaths of numbers of subordinate peoples from preventable disease or else provide them with working conditions consistent with their health. The gold-mining industry of South Africa had set an example to the world. The lessons it taught were that the type of compound provided for African natives should have a generous allowance of airspace and ventilation; that their rations should be full and well balanced; that the entry of native recruits into industry should be by easy stages; that pulmonary examinations should include an X ray of the chest; that weights should be recorded periodically to detect early cases; and that "old boys" should be periodically examined, as they tended to have chronic disease and to spread infection among newcomers. B.C.G. vaccine appeared to have only a restricted value for native populations.

Dr. S. J. MAHER (Chairman, Connecticut State Tuberculosis Commission) denied the statement, so often made, that tuberculosis was unknown among North American Indians until introduced by white men. Le Jeune had recorded in 1633: "Nearly all the young Indians were attacked by scrofula both on account of their filthy habits and because they eat and drink indiscriminately with the sick," and there were many later Jesuit records of scrofula and consumption. Skeletons more than two centuries old showed tuberculous bone lesions. Dr. Maher quoted many writers from that time to the present century, showing that American Indians, even in the wild, suffered from tuberculosis, and that the doctrine that tuberculosis had been a curse passed along by the white race was entirely false.

Dr. C. W. SECCOMBE described his experiences in Equatorial Africa, which confirmed those of previous speakers. He had seen very little tuberculosis. It was impossible to get on without the native and impossible to do with him unless he could be kept fit.

Dr. E. E. PREST (Ayrshire Sanatorium) pointed out the importance of preventing people who had not had much contact with tuberculosis from being suddenly brought against very large or very virulent doses. He regarded food, abundant and of the right kind, as the most important factor in building up resistance.

Dr. A. S. LAMB (Victoria, B.C.) described a survey of Indians made by the Canadian Tuberculosis Association. About 732 cases on the coast had been investigated in the summer of 1926 by physical and fluoroscopic examination and sometimes the cuti-reaction. The total incidence was 10 per cent. and was greatest between the ages of 5 and 14. Children of 12 gave a positive cuti-reaction in 90 per cent. of cases. The incidence had been very much the same among 528 Indians of the interior dry belt investigated last summer, except that these had more glandular tuberculosis than those on the coast, who were well-nourished fishers and hunters, rather more civilised, and decidedly cleaner in their person and homes.

Dr. A. C. LANKESTER said that his three years' experience in British India confirmed what workers in Africa had said. It was not the white race but the mistakes of civilisation that had brought the curse, and the greatest mistake of all was the Purdah system.

(To be continued.)

RADIUM FOR SHEFFIELD HOSPITALS.—A supply of radium has been acquired for use in the hospitals associated with the University of Sheffield—the Royal Infirmary, the Royal Hospital, and the Jessop Hospital for Women.

ANCOATS HOSPITAL "HOPELESSLY INADEQUATE."—Ancoats Hospital, which is this year keeping its centenary, stands in the heart of the industrial centre of Manchester, but it is officially described, in an appeal that is being issued for £100,000 for extensions and improvements, as "hopelessly inadequate." It treats 20,000 casualties a year, and last year over 3000 operations were performed in its single theatre; there are often 200 casualties waiting for treatment. There are at present 114 beds and one theatre, but at least 300 beds and three theatres are deemed necessary. It is hoped that the response to the appeal will permit of the addition of 100 beds, another theatre, a separate casualty block, a permanent massage department, enlarged X ray and pathological departments, and additional accommodation for the staff and nurses.

Reviews and Notices of Books.

BIOLOGICAL METHODS.

Methods of Biological Assay. By J. H. BURN, M.A., M.D. Camb. With an introduction by H. H. DALE, Sec.R.S., M.D., F.R.C.P. London: Humphrey Milford, Oxford University Press. With 22 illustrations. Pp. 140. 8*s.* 6*d.*

THIS work gives a complete account of methods of standardisation of those drugs which can be assayed with a sufficient degree of accuracy by biological methods. Dr. Burn has himself contributed considerably to the subject, and the book bears evidence throughout of his practical acquaintance therewith. The various methods are described with an attention to detail which on a hasty glance might seem almost too meticulous. But every laboratory worker knows how much more valuable descriptions of experimental methods are when given in full detail; apparently trivial points make all the difference between success and failure. A large number of alternative methods for the standardisation of the digitalis group is included. Attention is drawn to the fact that the U.S.P. requires that 1 c.cm. of a 10 per cent. tincture of strophanthus shall be equivalent in action on the frog to 8·3 mg. of ouabain, whereas tinctures of strophanthus on the English market are equivalent, on the average, to about 3·5 mg. per c.cm. The explanation of this curious discrepancy is not clear. It is worth while pointing out, however, that since strophanthin (Kombé or Hispidus) has certainly not more than 80 per cent. of the toxicity of ouabain for frogs, seeds which would give a tincture of the required U.S.P. potency would contain more than 10 per cent. of strophanthin, which is an improbably high figure. The maximum figure given in the literature for strophanthin isolated by chemical means is 3·6 per cent. A chapter on the standardisation of extracts of posterior lobe, in addition to the standard methods for oxytocic and pressor potency, contains an account of a method worked out by Dr. Burn for the quantitative determination of antidiuretic action of pituitary extracts. Chapters on insulin, ergot, arsenobenzene derivatives, adrenalin, œstrin, and various minor tests are also included. Not the least valuable part of the book is the insistence throughout on the necessity for the deliberate evaluation of the error of the various methods described, and the point is emphasised in a special chapter.

Objection has been raised sometimes to the use of biological methods of assay at all, because the results are only approximate. But approximation is, after all, only a relative term. Absolute accuracy is an unrealisable abstraction, though it is true that the 0·1 per cent. error that will satisfy a chemist would horrify a navigator. If a 10 per cent. accuracy can be obtained when estimating the potency of insulin, no clinician is likely to discover real differences between successive batches. But it is essential for the proper use of biological assay that the degree of approximation attainable should be definitely sought out, and Dr. Burn's insistence on this point is of great importance. The introduction by Dr. Dale is full of the wisdom of long experience of these methods. Dr. Burn's work is one which will repay reading, not only to those directly engaged in standardising drugs, but to general physiologists, chemists, and clinical workers.

Biological Monographs and Manuals. General Editors, F. A. E. CREW, Edinburgh, and D. WARD CULTER, Rothamsted. *Statistical Methods for Research Workers.* Second edition. By R. A. FISHER, Sc.D., formerly Fellow of Gonville and Caius College, Cambridge; Chief Statistician, Rothamsted Experimental Station. London and Edinburgh: Oliver & Boyd. 1928. Pp. 269. 15*s.*

IN this volume Dr. Fisher gives us a second edition of the text-book first published three years ago. The main body of the work is unaltered, but a short method of fitting polynomial regression lines has been added, and the table for the distribution of the variable "z" derived by transformation from the correlation coefficient has been enlarged. The only other addition is that of a chapter on the principles of statistical estimation. A discussion of this important subject is not usually found in an elementary text-book, and the differences in the results arrived at in a simple problem by different methods of estimation will be instructive to the student. The chapter is not easy reading for non-mathematicians, but it follows the lines of the rest of the book in putting before the research worker the latest results of Dr. Fisher's own work without going into mathematical theory. There is something to be said for this way of approach from the point of view of those workers who are concerned with practical statistical procedure, and not equipped to follow elaborate mathematics, but those who want to refer to the original papers will wish that the list of sources given had corresponding references in the text. The book covers wide ground not easily found elsewhere in elementary form. It deals especially with the most modern methods suitable for use with small samples, and aims at the type of problems which continually turn up in practical laboratory work. It needs and will repay careful study.

Modern Biology. By J. T. CUNNINGHAM. London: Kegan Paul, Trench, Trübner and Co. 1928. Pp. 244. 10*s.* 6*d.*

Mr. Cunningham has always been something of a biological nonconformist and we warmly welcome this volume, in which he brings his critical capacity to bear on many of the vexed problems of current biology. He treats especially of the mechanistic conception of life and of the inheritance of acquired characters and ends with a chapter on mind and consciousness. It is impossible to summarise what he has to say on these different topics; we may, however, specially mention the convenient critical accounts which are given of Tornier's views on abnormal goldfish and of MacDougall's experiments on the inheritance of reactions which white rats have learned and experienced through a number of generations. Biological experiments are surely very difficult—and perhaps even harder to interpret than they are to do.

NUTRITIONAL DISEASES IN CHILDHOOD.

Die Nährschäden des Kindes: ihre Entstehung, Verhütung und Heilung. By HANS ARON, Professor für Kinderheilkunde, Friedrich-Wilhelms University, Breslau. Berlin and Vienna: Urban and Schwarzenberg. 1928. Pp. 152. M.6.60.

DISORDERS of nutrition, although by far the commonest cause of ill-health in infants, receive curiously little attention either in the curriculum of the medical student or in text-books. Prof. Aron has, therefore, done medicine a service by preparing a book dealing exclusively and exhaustively with the cause, prevention, and cure of nutritional diseases in childhood. Knowledge of this subject is, as he points out, comparatively recent; every fresh medical discovery or investigation clashes with some preconceived opinion, and widely different theories on infant feeding are held by different schools. It is not the author's aim to discuss theories or schemes in any detail, but to collate the results of experiment and of clinical experience in the attempt to place the whole subject on a more scientific footing. Prof. Aron, writing for the practitioner as well as for the specialist in children's diseases, bases his monograph mainly upon cases met with in his own practice, rather than upon theoretical considerations or upon interesting or impressive cases recorded in the literature. He classifies disorders of nutrition according to their ætiology, the most important clinical types arising respectively in breast-fed and in artificially fed infants being considered. The use

of butter-milk is advised in many cases of under-nourishment in both types of feeding; its source and preparation are described in detail. In artificially fed infants the author is particularly concerned with the dangers of minimum feeding, suggesting that it is as harmful to reduce minimum doses of nourishment as it is to exceed maximum doses of medicine. One of the most interesting chapters deals with the faulty treatment of diarrhœa usually adopted, which treatment Prof. Aron looks upon as the most important cause of nutritional disorders in infancy. Details are given for the treatment of dysenteric diseases, in which butter-milk in conjunction with human milk is said to be the best "healing" diet, although one which in practice is not often available. Nutritional disorders arising from deficient albumin (in breast or cow's milk), carbohydrate, or vitamin content are discussed in turn, and the appropriate dietetic therapy indicated. "Thirst" diseases receive a chapter to themselves, the author pointing out, what is often forgotten, that the child requires, relatively, much more water than the adult. Prof. Aron urges in conclusion that "nutrition therapy" should receive at least as much attention in medical teaching and practice as any other form of therapy, medicinal, operative, immune, or physical. He believes that, were this ideal adequately carried out, disorders of nutrition in infancy would almost entirely vanish, and would be known only by name to future generations of medical students and physicians. His book is well worth reading, and may be warmly commended to all practitioners who have the care of infants and young children.

ON THE DYSENTERIES OF INDIA.

With a Chapter on Streptococcal Infections and Sprue. By H. W. ACTON, Professor of Pathology and Bacteriology, Calcutta School of Tropical Medicine; and R. KNOWLES, Professor of Protozoology to the School. Calcutta: Thacker, Spink, and Co. 1928. Pp. 178. Rs.7/8.

FOR their teaching of Indian post-graduate students in Calcutta the conjoint authors of the Dysenteries of India have come to recognise the need of a handy text-book on this subject, embodying the very real advances which have been made during and since the war. Although dysentery in its various forms is widespread throughout India, ranking as the third most important cause of mortality, yet the disease has never been the subject of any research expedition such as those organised against kala-azar and plague. This book clearly sets out the knowledge already gained and indicates the problems that remain to be solved. It is divided into nine chapters, dealing with the mortality and seasonal variations of dysentery in India and the relative incidence of the two main forms. The authors particularly emphasise the greater frequency and severity of the bacillary disease, a point which has been regrettably overlooked in spite of the experience during the war. Stress is rightly laid upon the proper use of the sigmoidoscope and the value of this method of diagnosis of dysenteries, but unfortunately the varied appearances are not described in sufficient detail to provide an accurate guide, and there are no explanatory illustrations. The bacteriology of bacillary dysentery is given in considerable detail, but the account appears to us to be unnecessarily complicated, including as it does much work which has not survived the test of experience. Moreover, the inclusion of streptococcal infection secondary to bacillary dysentery in a chapter devoted to sprue may give rise to the faulty inference that the latter disease also is secondary to dysentery.

A useful appendix containing seven pages of references shows signs of having been compiled in haste, for credit has occasionally been given to workers whose claim to priority is doubtful. In a second edition, when these small points have been revised, the book will serve admirably the purpose for which it is intended. The illustrations are excellent throughout. Those borrowed from Baermann and Eckersdorff's Atlas of Tropical Intestinal Diseases, published in 1913, are marvellously fine, and have brought to notice the existence of a work which was in danger of oblivion.

CLINICAL MEDICINE.

By OSCAR W. BETHEA, M.D., F.C.S., F.A.C.P., Professor of Therapeutics, Tulane Graduate School of Medicine: Chief of Medicine, the Baptist Hospital, New Orleans. London and Philadelphia: W. B. Saunders Company. 1928. Pp. 700. 35s.

THE preface states that this book is intended to occupy the gap in medical literature between large systems of medicine, running into several volumes, and condensed summaries. On such a plan 700 pages are clearly insufficient to cover the whole field of medicine, and the volume deals with only about a hundred of the conditions most commonly met with in medical practice. In making a selection for practitioners in England one would have omitted rare conditions—for example, dengue and tularæmia—and have included some at least of the manifestations of syphilis and such common nervous diseases as disseminated sclerosis or sciatica.

Each disease is discussed under the usual headings of ætiology, prognosis, diagnosis, and treatment, of which the last is in every case the most valuable. Those sections dealing with prognosis and diagnosis, though they include all the features of the disease in question, present them in such a way that important and characteristic points are not sufficiently emphasised. Hence the student is unlikely to gain a clear mental picture of the disease from them, nor will they assist a practitioner in differential diagnosis. On the other hand, the sections dealing with treatment are full, and the measures recommended sound and orthodox. Due attention is given to the general management of the case, which is too often neglected. Even if some of the suggestions prove to be impracticable, there can be no harm in setting out an ideal to be aimed at. Here, again, too little contrast is drawn between measures of first importance and those which are less valuable.

The book will, we think, be chiefly of value to the busy practitioner who, when a diagnosis has been made, wishes to decide what line of treatment to adopt.

LES TUMEURS VILLEUSES DU RECTUM.

By ANDRÉ LAMBLING, Ancien Interne des Hôpitaux de Paris. Masson et Cie. Pp. 120. Fr.18.

THIS monograph deals in an extremely practical manner with a condition which, according to Dr. Lambling, is more common than is usually supposed. His conclusions are based on a study of 37 cases of villous tumour of the rectum from the clinics of Dr. R. Bensaude and Prof. P. Lecène, Paris. After discussing ætiology, symptoms, and methods of diagnosis, the author discusses the pathology of the condition. Macroscopically three types may be distinguished—pedicled, sessile circumscribed, and diffuse; he points out that multiple tumours are common and easy to miss, which may explain some recurrences after apparently complete excision of a localised villous tumour. The diffuse form sometimes constitutes really a villous disease of the rectum (four cases). Ulceration is not necessarily evidence of malignancy, but may be inflammatory. Microscopically Dr. Lambling describes three types: (1) the benign villous tumour (18 cases); (2) the villous tumour with malignant degeneration (15 cases); and (3) villous malignant tumours (4 cases). He gives a clear description, illustrated by a series of good black-and-white drawings of the histology of the condition. He considers that malignant change often occurs first at the margins of the tumours, but the fact that it may remain localised for a long while renders surgical treatment possible even when delayed; this is fortunate, since it is easy to miss an early malignant degeneration. Chapter V. deals with

diagnosis; the importance of sigmoidoscopy is emphasised, and cases are described to illustrate the fallacy of assuming colitis to be the cause of diarrhœa without adequate examination. For treatment surgical excision is the method of choice; local excision after stretching the anus under spinal anæsthesia has been the most common procedure. It is essential to excise a circle of healthy mucous membrane with the tumour or recurrence is inevitable. For diffuse or malignant tumours some form of perineal excision may be required, or rarely an abdomino-perineal operation. Radium and deep X ray therapy were used only in inoperable cases, or where the patients refused a cutting operation. On the whole the results of radiotherapy have been extremely bad, and in certain cases it has been followed by rapid dissemination. Detailed case reports of 37 cases are included.

The volume constitutes a valuable addition to our knowledge of these tumours.

DISEASES OF THE BLOOD.

By A. PINEY, M.D., M.R.C.P., Research Pathologist, London Cancer Hospital. London: J. and A. Churchill. 1928. Pp. 195. 12*s*. 6*d*.

"THE student," says the author in his preface, "does not want much hæmatological detail, and the practitioner only requires bare outlines of immediate practical value." Some may be inclined to think that Dr. Piney puts the requirements of student and practitioner alike at rather a low level; but none can deny that, working on the basis that this level is the right one, he has written an excellent book. The arrangement is satisfactory, the matter up to date, and the author has managed to keep the number and variety of the technical terms used well in hand. The book is free from controversial matter which is something of a triumph in compromise, seeing that the author deals with the origin of the cells of the blood, the nature of "Banti's disease," and a number of other matters which continue to rouse hæmatologists to more or less heated polemics. It should have a wide popularity among students with their eyes on examinations and among the very busy practitioners mentioned in the preface.

BLACK'S VETERINARY DICTIONARY.

Edited by WILLIAM C. MILLER, M.R.C.V.S., Lecturer on Zootechny and Animal Management in the Royal Dick Veterinary College. With Contributions by a number of Authorities. London: A. and C. Black, Ltd. 1928. Pp. 1081. 21*s*.

THE Veterinary Dictionary, which has been modelled upon the plan of Black's well-known Medical Dictionary, is intended for all who own or have charge of domesticated animals, and for this reason the information contained in it is given in simple language, avoiding the dangerous knowledge which comes from only half understanding of scientific terms. Enough anatomy and physiology is included to lead the reader to recognise symptoms and so to be in a better position to initiate first-aid treatment. The book is more than a popular encyclopædia, for it contains a series of articles, amounting almost to monographs, by scientific writers. Dr. T. W. M. Cameron, for instance, of the London School of Hygiene and Tropical Medicine, contributes an article on parasites and parasitology, while Dr. F. A. E. Crew, Director of the Animal Breeding Research Department, Edinburgh, gives an outline of genetics and heredity which should serve to put the reader in touch with the scientific basis of animal breeding. Other signed contributions to this volume are from the pens of Prof. R. G. Linton (diet and dietetics), Mr. D. S. Rabagliati (cattle plague and other epizoötic diseases), and Prof. J. F. Shirlaw (new growths in animals). The volume is attractively printed and illustrated, and should appeal to a wide circle of those interested in animal health and disease.

MEDICAL RADIOLOGY.

Ergebnisse der Medizinischen Strahlenforschung. Edited by H. HOLFELDER, H. HOLTHUSEN, O. JÜNGLING, and H. MARTIUS. Leipzig: Georg Thieme. Vol. I., pp. 748. M.45; Vol. II., pp. 594. M.52.50.

THESE volumes begin a new radiological series, of which further volumes are promised at intervals of about a year. The editors aim at a complete presentation of certain selected subjects, combining original research with a critical survey of the literature, and they have achieved that aim by narrowly limiting the scope of each article and by entrusting each problem to experienced hands. The subjects appear to have been chosen somewhat at random, but in every volume there is new matter of diagnostic and therapeutic interest.

To Vol. I. Dr. A. W. Fischer constitutes a useful article on growths of the colon, with special reference to the diagnostic method of barium enema combined with air injection. E. Friedl and H. R. Schinz discuss the ætiology and X ray appearances in acute bone atrophy, and A. Lorey writes on miliary tuberculosis of the lung. The remaining articles deal with the physical theory and biological effects of radiation. Holthusen's "Physical Sensitisation" summarises what is known of the use of secondary radiation to enhance the biological effect of X rays. H. R. Schinz and B. Slotopsky contribute original and excellent experimental material upon irradiation of the testis in the rabbit. W. Lahm and H. Kurtzahn describe radiotherapy respectively in cancer of the cervix and cancer of the œsophagus. Lahm's article is practical, modest in its claims, and based upon the comparative results from all the great clinics, which he gives in detail. In Vol. II., H. H. Berg's fine article upon duodenal ulcer carries Akerlund's work a stage further, and is an outstanding achievement. If there are any radiologists in this country who do not use the "direct method" in the diagnosis of this condition, we feel sure that Berg's article will convince them of its value, while the others will find valuable technical hints and helpful ideas therein. The rôle of radiology in diseases of the central nervous system is described by O. Jüngling (ventriculography), and by H. Peiper (lipiodol). There is a good article on mediastino-interlobar effusions and their diagnosis by Felix Fleischner, of Vienna. The section on treatment comprises articles on the action of radiations on the acid-base equilibrium, on the ovaries, and in the treatment of bronchial asthma. Sections on diathermy of the bladder and on treatment of carcinoma of the tongue complete the volume.

The publishers have spared no pains to make the book worthy of the subject matter; the many diagrams and half-tone illustrations, and particularly the radiograms, are beautifully printed. Delicate detail, such as the lesions of miliary tuberculosis of the lungs, can only be well shown in actual photographic prints, and the use made of this form of reproduction in place of half-tone blocks is an instance of the extreme care taken over details. The radiologist, faced by bookshelves overflowing with periodicals, requires some courage to commence a new series; yet this annual is worthy of a permanent place in his library, and one who has studied these two volumes will look forward with keen interest to the appearance of others. He should order his volumes *bound*. The prices quoted above are for paper covers, which do not even outlast the curiosity of the reviewer. Cloth bindings cost only a few shillings more. (Price bound, Vol. I., M.48.6; Vol. II., M.57.)

EXTENSION OF WEST SUFFOLK HOSPITAL.—Mr. E. L. D. Lake, chairman of the reconstruction committee of this institution at Bury St. Edmunds, has laid the foundation-stone of a new out-patients' department. It is intended shortly to add a new women's ward and increase the accommodation for paying patients.

THE LANCET.

LONDON: SATURDAY, OCTOBER 20, 1928.

ANALYSIS OF LIFE.

As Sir FREDERICK HOPKINS reminded the Biochemical Society the other day, WÖHLER effected the first synthesis of an organic compound when he made urea in 1828. That finally disposed of the idea that live animals owed their obvious peculiarities to a chemical composition which could not be imitated in the dead world. In the succeeding 100 years the artistry of organic chemists has added one triumph to another—sugars, adrenalin, thyroxin, amino-acids, and polypeptides—and if nothing quite like a native protein has yet been made artificially it is not unjustifiable confidence to believe that someone will do it sooner or later. Particularly striking perhaps is the demonstration which has been given by Prof. E. C. C. BALY and his colleagues at Liverpool that formaldehyde and sugars can be formed from CO_2 and water on the surface of coloured inorganic substances such as nickel carbonate under the influence of light. There seems to be no reason to doubt that the chemical reconstruction of the substance of an animal or a plant is easily within the range of possible achievement.

Parallel with this chemical advance we have the development of the microscope and conspicuous progress in physical chemistry, especially in that branch of it which deals with the properties of the masses of matter—larger than simple molecules and too small to be clearly visible—which we call colloids. A great deal has been found out about the structure of live organisms and many of the strange things which happen in the body have been explained by processes of microphysics which can be reproduced outside the body. The imitation is certainly less complete than has been achieved in chemistry, and the hopes that the microscope would ultimately be made to magnify so much that it would show us life going on have been dashed by the realisation that the possibilities of the instrument in anything like its present form are necessarily strictly limited and that we cannot expect to see things which are less than a certain size. The physics of colloidal particles, surfaces, and membranes have suggested a number of explanations of "vital" phenomena, but whether the cells of the body actually do so work seems to be very hard to demonstrate. Those who wish to make a structural model of a cell or of a fibril of striped muscle or of a secreting gland are in the position of a chemist who was limited to single molecules; the pattern which they are copying is too small to investigate. However, it is possible that these difficulties may be overcome, and that the anatomy of the cell will be as completely reproduced as its chemistry.

When this has been done, will the product be alive? At the moment no one can predict the answer. On the whole it is probably fair to say that while chemistry, physics, and the microscope have helped us enormously to understand the mechanisms by which animals and plants carry on their activities, they have done little or nothing to explain life. There are plainly a good many qualities and possibilities which would have to be added to a perfect model of an organism before it would live; what we cannot tell is whether or no these qualities would appear spontaneously in the artificial construction, whether, that is, they are inherent in its structure and composition. There are the interrelationships of one part of the body with another, the dependence of the organism on its environment, the exact relation between structure and function which necessitates continual activity—different thinkers attach varying importance to these apparent differences between the live world and the dead, and our readers will find much that is of interest in the sober version of Prof. F. G. DONNAN's discourse at Glasgow, which is printed in *Nature* for Oct. 6th. But what strikes many people who have taken part in the discussion is that there is something more in an animal than a collection of mechanisms, and that if Prof. A. V. HILL explains the intimate details of cellular oxidation he will not necessarily reveal the secret of life. It has seemed to them characteristic of life that it should have a purposive appearance, and that while it uses the mechanisms which have been explained and many others which await dissection it is not their servant but their master. ROUX, from his discipline of functional anatomy, derived the conclusion that an animal is dominated by the end it is aiming at rather than the means which it uses to reach it, and medicine affords daily examples of the truth that if you obstruct or prevent the body doing something by its customary method it will do its best to do it by some other means. Among the higher animals, for instance, reproduction is so commonly sexual that such a method can be called the almost invariable rule. It is evidently convenient and effective. But it is not quite universal. Parthenogenesis is found as an odd and occasional occurrence as high in the animal scale as insects and molluscs, and it can be artificially induced in vertebrates; a form of budding in the larval stage occurs in certain insects and some armadillos regularly produce several young from a single egg; hermaphrodite animals generally prefer cross-fertilisation, but they will self-fertilise if congress is prevented. The mechanism of reproduction is therefore variable and its essence is not the union of an egg and spermatozoon, but the production of fresh individuals; the routes are different, the destination the same, and it is difficult to see how a satisfactory model could be made of this.

It may be, too, that in trying to define the essential distinctions between live and dead things we have made too much of their differences and not enough of their similarities, and that in thinking about the mystery of life we have overlooked the mysteries of the inorganic world. Two views are obviously possible: first, that live organisms can be sharply separated from the rest of the world as a class by themselves; secondly, that the whole universe is constituted of units which in many ways resemble one another, and range from atoms at one end to man and the spiritual world at the other. As Prof. A. E. BOYCOTT pointed out to the Pathological Section of the Royal Society of Medicine this week, the modern revision of our ideas about the structure of matter has certainly tended to assimilate the behaviour of atoms and molecules to that of live organisms. Instead of being fixed, permanent, and ultimate, we believe now that atoms have a highly complex structure, that they are subject to evolutionary changes, and that in the stars and in space they go through a cycle of destruction and reproduction not altogether unlike the life and death of animals. The old simplicity of the atom is gone, and its structure and behaviour are as mysterious as what we call life. If this is the right way of looking at the world, no solution of the problem of life is to be had by showing

it to be compounded of physics and chemistry. We get no further than a realisation that live and dead things are all related to one another much in the same way as the different members of the animal kingdom. Yet it is some advance to reach this point, especially to those who are content to leave philosophy alone and ask only for some satisfying basis on which they can pursue their examination of that part of the world which happens to interest them. There is much wisdom in Prof. LOVATT EVANS's advice to the physiologists at the British Association at Glasgow—that they should give up the hopeless attempt to know what life is, and should take it as it stands and study its manifestations, regarding the adaptation of organisms to their environments as the basal principle from which they start. And it would certainly be a relief to get quit of the endless controversy between vitalism and mechanism and be rid of the mysticism of vitalistic interpretations and the superficiality of mechanistic explanations. If we will agree that live things and dead things have more points of resemblance than of difference, we can end the discussion with the happy conviction that both parties have been right.

CARDIAC STIMULANTS.

CIRCULATORY failure may be startling in its onset, and as it is often fatal it always causes anxiety. The medical man in attendance feels that something must be done at once, and his natural tendency is to administer some drug which has a reputation as a cardiac stimulant, without giving very much consideration to the causes underlying the failure or the way in which the drug is likely to modify them. If the patient recovers, credit is given—perhaps quite wrongly—to the medicament; if the end is fatal, at least something in the way of active treatment has been tried. This is unsatisfactory, if only because it confuses opinion among clinicians about the relative efficacy of the so-called stimulants of the heart. Nor has the situation been made much clearer by the efforts of pharmacologists, who have, in fact, sometimes added to the difficulties of the subject by prematurely transferring the results of their experiments to practical therapeutics. To escape from this position, Prof. J. A. GUNN, in his presidential address to the Section of Therapeutics of the Royal Society of Medicine last week, suggested [1] as the first essential a better classification of cases of circulatory collapse. He would banish the term "cardiac failure" and substitute "paralysis of heart muscle," or "paralysis of vasomotor centre" or "paralysis of capillaries," according to the nature of the primary trouble. Though no one is likely to dispute the wisdom of this suggestion, the solution is not so easy as it may appear, for adjustment of the circulation involves complex correlations of the heart and vessels through central and peripheral mechanisms, and the analysis and interpretation of the phenomena of circulatory failure are difficult and elusive, because several factors are usually involved. Nevertheless we can determine along these lines the main features of some of the forms of circulatory failure, and settle in some degree the therapeutic requirements of each.

For failure arising from auricular fibrillation or some other disordered function of the heart everyone agrees that digitalis and its allies are useful, strophanthin being given intramuscularly or intravenously when a rapid effect is wanted. Apart from this group, failure appears as an urgent symptom, generally because the patient is suffering from acute or chronic disease, from a poison such as the general anæsthetics, or from the shock of injury. In these cases there is little reason for attributing it to the condition of the heart, since all the evidence goes to show that the fault lies chiefly with the central vasomotor control and the peripheral circulation—the arterioles and capillaries. If these could be induced to regain their tone the heart would be competent to carry on its work, so there is little to be gained here—and perhaps a great deal to be lost—by the indiscriminate injection of active cardiac glucosides. Rather should we turn to the other parts of the circulatory mechanism and consider how they can be affected. The vasomotor centre can be stimulated reflexly by local irritation varying in degree from the comparatively slight stimulus of a mouthful of spirit to the more powerful shock produced by the subcutaneous injection of alcohol or ether. Its excitability, as well as that of the closely allied respiratory centre, can sometimes—though not to any great extent—be enhanced directly by drugs such as strychnine and caffeine. The arterioles and capillaries can be made to contract by the direct action of pituitary extract and adrenalin, with consequent increase of blood pressure. We thus seem to have remedies suited to any situation, provided we can choose the drug appropriate to the type of failure, and provided the vaso-motor centre is not completely paralysed, nor the vessel walls completely lacking in excitability.

The circulatory failure resulting from poisoning of nearly every kind is commonly associated with respiratory failure. Here the danger lies in depression of the vital centres in the medulla, and the proper treatment is to give large hypodermic doses of alcohol, ether, or strychnine, together with artificial respiration. Exactly similar is a sudden collapse in the course of an acute or chronic illness. Except in angina pectoris, where the dilator effect of amyl nitrite is required to ensure better nutrition of the myocardium, there is the same need for stimulating the vaso-motor centre, or, if it is paralysed and does not react, for increasing the tone of the muscles of the arterioles, as can be done with pituitary extract. Whether adrenalin should be employed in either of those conditions is a question of some difficulty. Undoubtedly it can raise blood pressure and accelerate the heart, but it acts best when given intravenously, and the least over-dosage may throw too heavy a strain on the heart and vessels. Besides, its action is transitory. Adrenalin is therefore reserved, as a rule, for cases of complete or threatened cardiac arrest, and it is customary to give intravenously or by intracardiac injection not more than 0·2 c.cm. of the liquor, well diluted. The drug should not be used in the early stages of chloroform anæsthesia because it may produce ventricular fibrillation, but this mishap does not occur in the later stages. In primary shock after accident there is no sense in giving remedies which will increase the exhaustion of the vaso-motor centre; this exhaustion is itself due to excessive stimulation of sensory nerves. Nor indeed is it necessary to give any drug at all, for primary shock is seldom dangerous to life; warmth and artificial respiration will aid recovery. Secondary shock is much more serious, but drugs acting either centrally or peripherally on the circulation are of no avail in its treatment, as is only to be expected, since the underlying change in shock is the diminution in the volume of the circulating blood consequent upon the loss of blood plasma through the capillary walls. In such circumstances it is rational to increase the blood

[1] See THE LANCET, Oct. 13th, p. 758.

volume by liberal administration of fluids by the mouth, warm saline by the rectum, or, if necessary, by intravenous injection of gum saline or whole blood.

So far, in what may be described as emergency therapeutics, the position is fairly clear, but difficulties at once arise in considering the treatment of that ingravescent form of circulatory failure which often accompanies acute febrile disturbances, and which is, in fact, the usual terminal event in fatal infectious disease. Should digitalis be given at all, and, if so, should it be given early or late? These are questions easier to ask than to answer, but it may safely be inferred that where the efficacy of digitalis is in such doubt, its value cannot be very great. There is a body of clinical opinion which maintains the efficacy of digitalis in such diseases as pneumonia; on the other hand, experiments have shown that in acute pneumococcal infections in animals, the associated fall in blood pressure is a result of cardiac failure. Even when the pressure has fallen very low, clamping of the aorta still causes it to rise again sharply. If it is permissible to transfer to human beings the obvious deduction from this experiment—namely, that the heart is still capable of supporting a high blood pressure, and that the real cause of the circulatory failure is some central or peripheral change—there is no place for digitalis in the treatment of fevers. It will be more reasonable to try to keep the respiratory and vasomotor centres active by giving drugs such as strychnine, weak though their action may be, and to employ pituitary extract and adrenalin as adjuvants in emergency. These are subjects which need more extensive discussion; meanwhile it is clear that Prof. GUNN is right in saying that a clearer conception of the underlying basis of circulatory failure and a better classification of its varieties would greatly improve therapeutic practice.

GENERAL MEDICAL COUNCIL ELECTION.

THIS week-end voting papers will be issued by the Registrar of the General Medical Council in connexion with the election of Direct Representatives of the registered medical practitioners in England and Wales. There are two vacancies to be filled owing to the death of Dr. J. A. MACDONALD, of Taunton, and the resignation of Sir ROBERT BOLAM on his appointment as Representative of the University of Durham on the Council. For these two vacancies there are four candidates, two of whom were officially endorsed by the members of the British Medical Association at their Cardiff meeting, and two who are standing as Reform Candidates under the ægis of the Medical Practitioners' Union. We print on another page the election addresses issued by these candidates. Dr. J. W. BONE and Dr. E. K. LE FLEMING remark that at the present time only two of the members of the Council are general medical practitioners. They are themselves both in the active pursuit of medicine, with the added qualification of having had much experience of administration and medico-political work. Dr. BONE has carried on private and contract practice for 32 years in the industrial area of Luton. Dr. LE FLEMING has seen similar service for 27 years in the rural area of Wimborne. Both feel that the educational outlook of the Council has in the past been somewhat that of the teacher, and they propose to introduce a further leaven of members engaged in family practice to assist the Council in preparing the medical student for a career which in the great bulk of cases is that of a general practitioner. The penal procedure which occupies so much of the Council's time turns on situations which arise in the lives of general practitioners. Dr. GREGG and Dr. WARD find the General Medical Council somewhat ill-adapted to modern conditions. They see evidence of defects in three directions—namely, the small representation of the public, the scarcely greater representation of the general practitioner, and the difficult position of the Council in disciplinary matters. Both candidates have given many years of service in medical organisation and public work, and, if elected, they pledge themselves to initiate discussions which shall lead the Council to prepare a schedule of reforms for the approval of the State.

Direct Representatives hold office for a term of five years (when they are eligible for re-election), and accordingly it is not often that the medical profession as a whole is called upon to exercise its suffrage. The two sitting representatives for England, Sir JENNER VERRALL and Dr. H. B. BRACKENBURY, hold office until Jan. 1st, 1930, and the same is true of Sir NORMAN WALKER, who represents Scottish practitioners, and Dr. LEONARD KIDD, who is direct representative for Ireland. At the last election, held in the autumn of 1924, when there were eleven candidates for four seats, and voting was of a more complicated nature than it is this time, 562 practitioners rendered their votes invalid by disregarding the instructions on the paper. The total number of voting papers issued in 1924 was 29,179, of which only 607, or about 2 per cent., were returned as dead letters. This, as we then remarked, speaks for the high accuracy of the Medical Register. The election is quite properly used as a golden opportunity for still further enhancing this accuracy, and we call attention to the Registrar's request in our correspondence columns to the effect that any practitioner who does not receive a voting-paper during this week-end should communicate with the office of the Council in order to ascertain that his address is correctly registered.

CECIL HOUSES.

"THE need for accommodation for homeless women, who through no fault of their own are without permanent shelter, grows apace." This is the conclusion recorded in the first annual report published in connexion with the Cecil Houses, of which there are now three, two being in full working order, and the other to be opened at the end of the year. The aims and objects of the Women's Public Lodging-house Fund, which was inaugurated in 1926, largely owing to the enthusiasm of Mrs. Cecil Chesterton, are as follows: the fund seeks to provide suitable premises and to meet at cost price the acute need of clean beds, bathing, and washing accommodation for homeless or vagrant women. It has been established solely for the purpose of social service, and in no circumstances will any profit be made, but apart from redemption of capital expenditure each house is designed to become self-supporting. Cecil Houses are non-sectarian, and women applying for beds are not called upon to answer any questions about their past history or the reason why they have come to a common lodging-house. The first house, situated at 35, Devonshire-street, London, W.C. 1, has beds for 44 women and cots for two infants. The one at 47, Wharfdale-road, N. 1, has 60 beds and 10 cots, whereas the new house at 194, Kensal-road, W., will accommodate 65 women and 10 infants. For one shilling a night a woman can get a good bed, a hot bath, and facilities for washing her clothes. A minimum of £5000 is needed to found each house, and subscriptions and donations are urgently required.

Annotations.

"Ne quid nimis."

THE INCIDENCE OF EYE DISEASES.

AT the Royal Society of Medicine last week Mr. Cyril H. Walker inaugurated his term of office as President of the Ophthalmological Section by an address on Some Recent Changes in the Incidence of Ophthalmic Diseases. Several diseases of the eyes, he said, which used to be extremely common are now comparatively rare, at any rate in Bristol and the surrounding district. One of these was blepharitis of the lids in both the squamous and pustular varieties; another was phlyctenular disease of the conjunctiva and cornea. The diminution of blepharitis was no doubt due to the improvement in the cleanliness of children of the hospital class, and of phlyctenular disease to an improvement in their nutrition, due to the general raising of the level of wages since the war. Even more encouraging was the drop in the incidence of ophthalmia neonatorum. The percentage of children in a Bristol blind school who have lost their sight owing to this disease is not more than a quarter of what it was 50 years ago. In Bristol the number of cases notified fell from 137 in 1922 to 59 in 1927. This quite recent decrease is remarkable, and may perhaps be attributed to more efficient prophylaxis by midwives and the earlier treatment secured. In Bristol the routine use of silver nitrate for prophylaxis had been abandoned and a 1 per cent. solution of mercurochrome substituted. Syphilitic iritis was now becoming one of the uncommon affections of the eye, and lamellar cataract, associated with defective enamel of the teeth and rickets, was now seldom seen. Perhaps even more remarkable was the comparative rarity of cases of genuine primary acute glaucoma. Whether this was due to the fact that many cases which would formerly have been diagnosed as primary are now found to be secondary is a matter on which Mr. Walker did not express an opinion. The idea that it had anything to do with the indiscriminate use of atropine by the general practitioner in former days he rejected as a libel on his older colleagues in general practice.

All this is very encouraging and the question may be asked: Why, then, is the number of patients attending eye hospitals and eye departments as great or greater than it ever was before? The greater care which is now devoted to the correction of refractive errors is doubtless the principal reason, but not the sole one. There are some serious eye diseases which show no sign of diminution. Though acute primary glaucoma is rare, chronic glaucoma is as common as ever. Certain forms of cyclitis associated with keratitis punctata are even more common than formerly. Although cases of lamellar cataract are seldom seen, senile cataract still afflicts a certain proportion of the population over middle age, and so far as its pathology and prevention go, presents problems which are as yet completely unsolved.

SYPHILIS IN PARIS.

THE latest figures suggest that syphilis is on the increase in Paris. The venereal diseases dispensary at the Hôpital Saint Louis, which receives patients from all over Paris and the surrounding districts, reports that the number of cases, after having fallen regularly from 1920 to 1924, began to rise again in 1925, and since then has risen each year, the number of new cases registered in 1927 being almost exactly what it was in 1920. Various possible explanations for this state of affairs are discussed by Jeanselme and Burnier.[1] At one time, they point out, it was thought that the disease was being imported by immigrants, but it was found that 80 per cent. of the foreigners under treatment had become infected in France, and at present the proportion of immigrants under treatment is small. Undoubtedly a serious factor is that only a small proportion of infected women present themselves for treatment at the dispensaries. In 1927, out of 611 new cases of syphilis, 409 patients were men and 202 women. It is suggested that an intensive campaign should be undertaken among women and that better arrangements for privacy should be made in the dispensaries. Unfortunately it is only too common for patients to give up treatment as soon as the external signs of the disease have disappeared. Only about a third follow their treatment regularly, and more than half give it up after a few injections. Here social workers can be of great help; also the loss of time through attendance at the dispensary should be reduced to a minimum. Jeanselme and Burnier consider that many medical practitioners are not up to date in their methods of diagnosis and treatment, so that valuable time is lost at the onset of the disease, while the patient spreads infection. They urge that every medical student, without exception, should be obliged to take a course of training in a venereal diseases department, and that all dispensaries should be regarded as schools where practitioners may come to improve their technique. They believe that clandestine prostitution is considerably increasing in Paris, and that this is contributing to the endemic of syphilis. It will be remembered that France is one of the few remaining countries where State regulation of prostitution is still in force, but the number of women arrested for infringing the police regulations has regularly increased during the past five years.

[1] Bull. de l'Acad. de Méd., 1928, c., 749.

RECENT WORK ON SPRUE.

A DEFINITE and serious attempt has been made at the Haffkine Institute, Bombay, to unravel the mysteries of sprue. F. P. Mackie and his fellow workers have already published in the *Indian Journal of Medical Research* a series of papers on the biochemistry of this important and widespread disease, and now in conjunction with G. D. Chitre, he has once more tackled the vexed question of its exact relationship to yeasts. In a profusely illustrated study[1] they recount investigations showing that whilst the yeast fungus, known as *Monilia psilosis*, originally described by Ashford, can be found in 40 per cent. of cases of sprue in Bombay, an identical organism is present with equal frequency in other intestinal diseases as well as in healthy individuals and animals. The work they have done gives no support to the view that *M. psilosis* (so-called), or any other yeast-like organisms studied, has any causative relationship to sprue. Their study of the structure and life-history of intestinal yeasts leads them to think, moreover, that the value of the fermentative properties of these organisms as a basis of classification has been much over-estimated and that really the human intestinal yeasts are relatively few in species and are much more easily classified on broad lines into a few distinct types. The variability of strains on subculture is very great, and Mackie and Chitre urge that it is unscientific to create a large number of species on inconstant characters. The net result of their labour is wholly negative, but it has cleared the air for further investigation and has definitely brought to an end much work on the yeast theory of sprue which was unsound and required refutal. At the same time it has borne out the results of Manson-Bahr's research in Ceylon in 1912–14, which was published in a report to the London School of Tropical Medicine in 1915.[2] The conclusions reached at that time were that the yeast fungi found in sprue were indistinguishable from the thrush fungus (*M. albicans*) and that their exact

[1] Indian Medical Research Memoirs. No. 11. (Supplementary Series to the Indian Journal of Medical Research.) Yeasts and Sprue. By Lieut.-Colonel F. P. Mackie, I.M.S., and G. D. Chitre, B.M.S. Published for the Indian Research Fund Association by Thacker, Spink, and Co., Calcutta. Pp. 39. Price Rs.3. 12 annas, or 5s.

[2] A Report on Researches on Sprue in Ceylon. 1912–1914. mbridge University Press, 1915.

relationship to the disease was problematical. A definite stand was taken against the uncritical classification of these organisms by means of certain biochemical reactions.

For many years, almost since the first accurate description of the disease in 1881, it has been known that liver, in the form of liver soup, exerted a definite curative action in sprue, especially in advanced cases associated with a high degree of anæmia, and some results of treating the disease with liver extract have lately been described by B. K. Ashford,[3] whose name is well known on account of his work on the ætiology. Fourteen patients received in addition to the recognised sprue diet a daily dose of Lilly and Co.'s liver extract, No. 343. It was found that the anæmia of sprue responded in a remarkable manner. Those cases with a high colour-index and less than two million erythrocytes yielded a shower of reticulocytes unless the bone-marrow was absolutely exhausted; on the other hand, those cases with an erythrocyte percentage of more than 60 showed no appreciable response. This sudden eruption of reticulocytes produced by liver extract acts like an internal transfusion and within a couple of weeks is followed by a permanent rise in the erythrocytes and in the hæmoglobin.

CLINICAL EVIDENCE OF HYPERVITAMINOSIS WITH VITAMIN D.

ATTENTION was drawn in our columns on June 9th of this year to the work of A. Kreitmair and T. Moll, which is quoted by Dr. W. Pfannenstiel on p. 845 of our present issue, and indeed arose out of Pfannenstiel's own early observations on rabbits fed with various doses of irradiated ergosterol. Kreitmair and Moll showed that there is a danger of "hypervitaminosis" when irradiated ergosterol is administered in excess. Their work dealt only with animals, though with a variety of types, and did not include any observation of the condition in human beings; indeed, they expressed the opinion that it would be necessary for a man to consume a daily dose of 100 mg. of irradiated ergosterol in order that a deleterious effect should be produced, whereas the maximum dose ordinarily administered to a human being would be about 5 mg. The actual risk, however, appears to be less remote. A. F. Hess and J. M. Lewis[4] have been in the habit of using daily doses of from 2·5–5 mg. of irradiated ergosterol in the treatment of rickets in infants, and have found it remarkably effective in all cases, even including those in which cod-liver oil had failed. Besides X ray examination, they used as criteria of healing the percentage of calcium and of inorganic phosphate in the blood. Among a highly satisfactory series of cases there occurred a very few in which the treatment was too drastic. In four cases the inorganic phosphate was as high as 10·4 mg. per 100 c.cm., a value double the normal, but no clinical disturbance of any kind was apparent. In several the calcium of the blood rose above the normal, 17·6 mg. per 100 c.cm. being the highest value recorded; excessive calcification could also be seen in the X ray picture. In certain of these cases the dose of irradiated ergosterol had been much increased, but in others it was not greater than that normally given. Two infants showed untoward symptoms associated with the hypercalcæmia—notably loss of weight, with vomiting, fever, and marked drowsiness—a condition reminiscent of that which the authors had noticed when, in their first use of ultra-violet light in 1918, they had given excessive doses. Hess and Lewis discuss the means by which the result which they observed might have been brought about. They refer to J. B. Collip's[5] well-known production of a fatal hypercalcæmia in dogs by administration of an excess of parathyroid extract. They point out that in the dogs the serum calcium declined at once when the parathyroid extract was stopped, whereas in the infants, where the hypercalcæmia was caused by an excess of irradiated ergosterol, it persisted for 30 days after the treatment ceased. They say: "It seemed as if the irradiated ergosterol either was stored or stimulated the parathyroids or other glands which regulate calcium metabolism," and they incline to favour the latter view. The more general opinion (cf. I. Greenwald and J. Gross[6]) is that the hypercalcæmia induced by parathyroid excess is maintained not by increased absorption but by mobilisation from depôts within the body, and that it is accompanied by increased excretion and by excessive loss of calcium from the bones. Hess and Lewis state that they observed just the opposite condition, one of excessive deposition of calcium in the bones, indicating more probably a greatly heightened assimilation of calcium. The whole question of hypervitaminosis with vitamin D will have to be studied, since the results even of controlled experiments by different observers are not yet harmonious. R. E. Harvard and J. C. Hoyle,[7] for example, giving a daily dose of 8 mg. of irradiated ergosterol to a healthy adult for 21 days in the winter, could find no increase in the content of serum calcium or of inorganic phosphate either above the normal or above the value in the pre-experimental period. In any case the dosage of irradiated ergosterol recommended for free use in clinical medicine should be carefully considered in the light of all the observations so far recorded.

BACTERIOLOGY OF PUERPERAL INFECTION.

A NUMBER of investigations have been made into the vaginal flora of normal women and of cases of puerperal septicæmia, and most of them have incriminated the streptococcus—particularly the hæmolytic variety—as the chief cause of fever during the puerperium. The Obstetrical Research Committee of the Melbourne University recently authorised another investigation on these lines, to see whether local hygienic and climatic conditions had any influence on the bacterial flora. An abstract of the results has just been published in the ninth annual report of the Walter and Eliza Hall Institute of Research.[8] Among 50 morbid cases examined post-partum or post-abortum streptococci were found in 36 per cent., the non-hæmolytic strains being generally associated with milder degrees of illness. Gonococci, accompanied by a characteristic type of fever, were found in 8 per cent. Various other organisms appeared, but could not be related to any definite morbidity. Streptococci inhabited the vagina of 24 healthy pregnant women and only two of these had febrile puerperia, while six women in whom no streptococci were found had some degree of fever. Dr. Lucy Bryce concludes that the mere presence of streptococci does not account for puerperal fever, and that the biological properties of the organism in question constitute an important factor. Streptococci, staphylococci, diphtheroids, and coliform organisms were commonly found in the puerperal uterus of healthy patients, and the research workers could only fall back on some undefined increase in virulence to explain why morbidity occurred in some cases and not in others. This, after all, does not take us very far. The fluctuating relationship of virulence to resistance must always be a delicate balance, dependent on a host of processes—metabolic, endocrine, and psychological. While the bacteriologist will stress alterations in virulence, the clinician will speak of degrees of resistance and the epidemiologist will ponder "epidemic constitutions." It may be that the factors which make Mrs. A succumb to a chained coccus while Mrs. B harbours the same organism without hurt will always remain incalculable. Twenty years ago we were happy in

[3] Jour. Amer. Med. Assoc., July 28th, p. 242.
[4] A. F. Hess and J. M. Lewis: Jour. Amer. Med. Assoc., Sept. 15th, 1928, p. 783.
[5] J. B. Collip and E. P. Clark: Jour. Biol. Chem, 1925, xlv., 485.
[6] I. Greenwald and J. Gross: Jour. Biol. Chem., 1925, lxvi., 217.
[7] R. E. Harvard and J. C. Hoyle: Biochem. Jour., 1928, xxii., 713.
[8] Melbourne: J. C. Stephens, Ltd., 1928; see also Med. Jour. of Australia, March 3rd, June 30th, and July 28th, 1928.

believing that the entry of certain organisms into any body produced inevitably certain specific diseases. That simple explanation is being slowly unlearned, and complex problems like that of maternal morbidity serve as useful though humiliating reminders that the reactions of the human organism can never be discounted, however "virulent" the invader of its peace.

REGIONAL ANÆSTHESIA IN DENTAL OPERATIONS.

ONE of the most striking advances in dentistry during the last decade has been the development of local anæsthesia; in this respect, dentistry is considerably in advance of surgery as far as this country is concerned. The technique of local anæsthesia has now reached such a pitch of perfection that it provides an invaluable and indispensable aid to the dentist in carrying out the extraction of teeth without pain. At first the method employed was that of a simple infiltration of the gum round the tooth to be extracted, but though this is often efficient it frequently fails, and the method of regional anæsthesia was introduced by which a nerve is blocked at some distance from the tooth to be extracted. In the mandible, where the bone is dense and the anæsthetic cannot easily reach the tooth, regional anæsthesia is especially useful. A still further development of local anæsthesia has been its employment to produce insensibility during the procedure of filling teeth. Since the realisation of so-called painless dentistry is much to be desired, this aspect of local anæsthesia is of considerable importance from the patient's point of view. A serious defect in the use of regional anæsthesia in the mandible for filling operations is the fact that, while the anæsthesia produced may be sufficient to allow the tooth to be extracted without pain, the pulp oftens remains sensitive and the anæsthesia therefore fails in its object of allowing a cavity to be cut out without pain. The paper by Dr. D. Stewart and Mr. S. L. Wilson, which appears in our present issue, offers a reasonable explanation of this phenomonen and suggests a way whereby regional anæsthesia in the mandible may be made effective both for extraction and conservative operations. They have shown that the pulps of the mandibular teeth receive their nerve-supply not only from the inferior dental nerve, but also from the lingual and the long buccal nerve. If these two nerves are effectively blocked, sensation in the pulp is completely abolished. Another interesting point brought out in this investigation is that the mandibular nerve does not end at the mid-line but crosses to the opposite side, to invade the region which should be sensitised by the nerve on that side. This overlap of sensation may extend as far as the lateral incisor on the opposite side. Whether from the viewpoint of anatomy or of dental surgery, this work from the Manchester Dental School is of interest, quite apart from its value to the patient in ridding him more completely of his fear for the dentist's chair.

THE TREATMENT OF LUPUS ERYTHEMATOSUS.

MOST dermatologists now regard the gold treatment of lupus erythematosus as the best so far devised, whether the underlying cause be accepted as tuberculous or septic. Dr. J. Malkin,[1] of Leningrad, reports that he has used the preparation called krysolgan in 62 cases, and it is interesting to learn that in none of them was a maximum dose of 0·05 g. exceeded at any one attendance. The total weight of the drug, which was administered intravenously in 1 per cent. aqueous solution, averaged between 0·15 and 0·2 g. for the whole course of 10 to 12 weekly injections. As a rule two such courses were given, and the injections were stopped for a time if there was any sign of intolerance, such as albuminuria, fever, headache, palpitation, or dermatitis. Malkin has divided his cases into three clinical categories:—

Group I. (15 cases).—Erythematous types, mostly on the face, with localised bright red to cyanotic discreet patches of various sizes, in which scales were few and only loosely attached. The scars after involution were very delicate and almost invisible, and it was in these cases that exacerbation was most marked when it did occur, which was very rarely.

Group II. (27 cases).—Discoid, infiltrated, scaly "butterfly" type, often with depressed centre and raised circumference. These cases left much more obvious scars than those of type 1.

Group III. (20 cases).—Diffuse, infiltrated, often confluent patches of irregular contour with intervening bands of scar tissue. The cicatrices left after involution resembled those in Group II.

No less than 24 patients, mostly in Group II., are said to have been discharged completely cured of their irksome disability, 25 were greatly improved, and 11 improved to some extent. Attention is drawn to the fact that some of the patients whose cure was incomplete had not finished their full course. If these results are confirmed the outlook is very encouraging, for they are better than any hitherto published. But it is surprising that they should have been obtained with the doses stated, since these are much smaller, as far as we know, than the smallest which other workers have used successfully.

[1] Dermat. Woch., 1928, lxxxvi., 852.

HEALTH IN ICELAND.

THERE is some interest in the health experience of an island community of 100,000 persons leading so sequestered a life as in the case with Iceland. Although somewhat bigger than Ireland only the lowland coastal area, about one-fourteenth of the whole island, is habitable. The report[1] before us deals with the year 1926 and is printed in Danish with an English summary. In this year the marriage-rate was 6·1, the birth-rate 26·1, the death-rate 11·1, the infant mortality-rate 49·3, and the natural increase of the population for the year 1647 persons. There were three outbreaks of enteric fever all traced to milk which caused 175 cases and 13 deaths. The outbreaks were overcome by isolation and preventive vaccination, but the danger of a repetition, it is pointed out, exists as long as the milk is not pasteurised. Seventy-one cases of diphtheria, mostly of a mild type, caused two deaths. Acute rheumatism was of a comparatively mild type and no deaths were attributed to it. All diseases are apparently notified and in 1926 there were 4799 cases of acute bronchial catarrh, presumably most frequent in the towns as the rural population do not apply for medical aid against it. There is usually an epidemic wave of catarrh beginning in October, reaching its maximum in February and its trough in June to September. The outbreaks often coincide with the immigration of labourers, fishermen, and scholars. In the Westman Islands it is noted that the immigrant fishermen are more susceptible and catch catarrh first and then infect the resident population. The death-rate from pneumonia is much the same as in this country, about 1 per 1000, but the death-rate from bronchitis was only 0·09. One of the remarkable incidents of the year was an outbreak of epidemic pleuritis, which gave rise to 431 cases with no deaths. This epidemic began in the capital Reykjavik in June and spread to about 20 districts in the latter half of the year. The disease lasted about one to one and a half weeks or longer, and in some cases the pleuritic pain was very severe. It has been suggested that the disease is caused by insects, but others consider it to be a modification of influenza. There have been several small outbreaks of it since 1911. Both measles and German measles have been recently imported, and it is noted that the efforts to prevent the spread only had the effect of causing protracted epidemics which lasted about two years in each case. There were 3115 cases of influenza regis-

[1] Reykjavik, Fjelagsprentsmidjan.

tered, as against 941 in the previous year. Most people who had influenza in 1925 escaped it in 1926. Venereal diseases are chiefly limited to the few towns in active communication with foreign countries. Thirty-two cases of syphilis were notified, 14 being foreigners, and there were 236 notifications of gonorrhœa, 41 being of foreigners. Both these figures are about the average of recent years. The death-rate from tuberculosis is very high, about 2 per 1000, and shows no tendency to decline, and in these respects the experience of Iceland resembles that of the Shetland Isles. Tuberculosis of the lungs is more frequent in women than in men, and about 20 per cent. of the tubercle deaths were due to the meningeal form of the disease. There were 12 deaths attributed to hydatid disease. The number of lepers decreases. In 1921 there were 63, and in 1926 49, of whom 36 are in the hospital. In 1926 there were only four deaths from child-bearing registered, a rate of 1·5 per 1000 births. The medical men in the island number 1 per 1000 and the midwives 2 per 1000 of the population. There are 6 hospital beds per 1000 of the inhabitants and one antituberculosis dispensary at Reykjavik. The university laboratory has been supplied with a new equipment for bacteriology and serology. In spite of lively building activity there is a considerable shortage of houses, especially in the towns. During recent years electric heating and lighting has been installed in several forms, small waterfalls being the source of power. In one of the most isolated rural districts nearly every farm has electric heating and lighting, a great deal of the machinery, including the turbines, being made by resident craftsmen. Vaccination has been legally enforced since 1910. In 1926 3060 children were vaccinated for the first time and 2215, aged 12 to 13, were revaccinated. Medical inspection of schools is obligatory and regulations to secure uniformity have just been introduced.

THE SURGEON AND HIS INSTRUMENT-MAKER.

WHEREAS it was only comparatively lately that the physician gave up the preparation of his own drugs, the surgeon has always had to rely on his instrument-maker. The craft is not one that comes within his scope, and doubtless from the earliest times he has gone to his cutler, described his requirements as nearly as he could, and returned to his surgery knowing that his idea would be faithfully executed, probably better than he conceived it. Mr. H. S. Souttar, replying to the toast of The Guests at the annual dinner of the Surgical Instrument Manufacturers' Association on Oct. 12th, told many truths that ought to be more widely recognised. Although surgeons now fully realise what they owe to the surgical instrument-makers, they have taken a long time to do so, and Mr. Souttar thinks that students even nowadays knew very little about the tools on which they depend so implicitly. One of the most paralysing tasks of the examiner in surgery is imposed, he said, when the surgeon hands a candidate an instrument and asks him what it is. More often than not the reply is heartbreaking. He finds that students take infinitely more interest in an operation if they are made responsible for the instruments, and when at a demonstration of artificial limbs they are unable to tell which leg the patient has lost, they are apt to conceive a profound respect for the maker of the substitute. Although Mr. Souttar, as a keen surgeon, may slightly underrate the trouble to which examination candidates go, at many schools, to learn the names and use of instruments which they will probably never see again, he is certainly right in maintaining that the indebtedness of the surgeon to the manufacturer is great and growing. The complexity of modern instruments, due largely to the inventiveness of surgeons, throws a strain upon the maker's skill and patience, but his courtesy and helpfulness do not fail. It is, moreover, satisfactory to know that British instrument-makers can more than hold their own, and that instruments hailed as novelties abroad are usually obtainable both better and cheaper in London or Edinburgh.

THE annual conference of representatives of local medical and panel committees will begin at 10 A.M. on Thursday, Oct. 25th, at the House of the British Medical Association, Tavistock-square, London, W.C.

THE Bradshaw Lecture of the Royal College of Physicians of London will be given at the College at 5 P.M. on Thursday, Nov. 1st, by Dr. A. G. Gibson, whose subject will be Pyelitis and Pyelonephritis. Dr. G. F. Still will deliver the FitzPatrick Lectures, on the History of Pædiatrics to the End of the XVIth Century, at the same hour and place, on Tuesday, Nov. 6th, and Thursday, the 8th. Members of the medical profession will be admitted on presentation of a card.

THE Bradshaw Lecture of the Royal College of Surgeons of England will be delivered in the theatre of the College in Lincoln's Inn-fields by Mr. C. H. Fagge on Thursday, Nov. 8th, at 5 P.M. The subject will be Axial Rotation, Purposeful and Pathological. Fellows and Members of the College are invited to attend, whilst students and others who are not Fellows or Members of the College will be admitted on presenting their private visiting cards.

THE fifth meeting of the International Congress of Military Medicine and Pharmacy will be held in London in May, 1929, under the patronage of H.M. the King. The subjects to be discussed include: the evacuation of sick and wounded by water and by air; tropical fevers of short duration; wounds of blood-vessels and their sequelæ; the physical and chemical analysis of the glass and rubber articles employed by the medical services; and the standard of dental and physical fitness in the various military services. All medical officers, dental surgeons, and pharmacists belonging to, or having belonged to, the forces of all nations admitted to membership of the League of Nations are invited to the Congress, and also all officers belonging to organisations in association with the medical services. The chairman of the organising committee is Lieut.-General Sir Matthew Fell, Director-General of the Army Medical Services, and the secretary is Major A. D. Stirling, R.A.M.C., who may be addressed at the War Office, Whitehall, London, S.W. 1. Those who intend to be present should inform the secretary as early as possible before Jan. 1st, 1929, and at the latest by Feb. 1st. The railway companies in Great Britain and Ireland have agreed to issue tickets at reduced fares to members of the Congress between May 4th and 13th.

QUEEN MARY'S HOSPITAL FOR CHILDREN.—The scheme under which 350 additional beds are to be provided at Queen Mary's Hospital for Children, Carshalton, for the treatment of London children suffering from rheumatic diseases has been approved by the Ministry of Health. The Metropolitan Asylums Board propose to increase the accommodation for patients and resident nursing staff by the erection of new blocks for the staff, which will eventually number 570, of two new ward blocks for patients, and a new chapel, thus releasing the ward which has hitherto been used for this purpose to its proper function. In the nurses' home a wash basin will be fitted in every room, and electric lifts will be provided in each of the four blocks. The patients to be admitted to the new beds are children of both sexes under 16 years of age who are suffering from (a) subacute rheumatism, (b) the later stages of acute rheumatism, (c) rheumatic chorea, or (d) rheumatic carditis.

MEDICAL GOLFING SOCIETY.—The autumn meeting of this society was held at Princes Golf Club, Sandwich, on Oct. 13th and 14th. The results were as follows:—Singles and Bogey (for Dr. Bathurst's prize): 1st, T. A. Torrance, 2 up; 2nd, N. C. Carver, after a tie at 2 up each. Foursomes and Bogey: 1st, N. C. Carver and G. T. Hebert, after a tie with T. A. Torrance and Sir Kenneth Goadby, each couple being 2 down. Canny Ryall Cup: 1st, J. D. Gray, 92 − 16 = 76; 2nd, A. Gallitty, 82 − 5 = 77; 3rd, Yorke Davies, 96 − 18 = 78; 4th, Rolf Creasy, 91 − 12 = 79, D. F. A. Neilson, 88 − 9 = 79, and F. A. Woodhouse, 86 − 7 = 79.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

VIII.

THE SIGNIFICANCE OF HEARING TESTS.

BY HAROLD BARWELL, F.R.C.S. ENG.,
CONSULTING SURGEON, DISEASES OF THE THROAT AND EAR, ST. GEORGE'S HOSPITAL.

IT must be admitted that the tests of acuity of hearing, as they can ordinarily be applied in the otologist's consulting-room, are necessarily rough and inexact, as compared, for instance, with tests of visual acuity. There is no accurately defined normal of hearing power which can be taken as a starting-point; perfect acuity of hearing is considerably greater than is required in ordinary civilised life, and very many people whose hearing falls short of this high standard are unaware of any disability, and must for all practical purposes be considered to have normal hearing. In recent years an electrically operated instrument, the audiometer, has been introduced in America, especially by Dr. W. F. Dean and Dr. E. P. Fowler, by means of which any tone from 64 to 16,000 double vibrations per second can be produced at any desired strength or amplitude, so that the minimum audibility for every tone may be found for either ear and plotted on a chart. This, although a valuable instrument from which much is expected in research, is not at present in regular use in the consulting-room. Even with this apparatus the precision of the results must largely depend on the intelligence and accuracy of the patient, and this is true in a greater degree of the tests ordinarily applied. The intensity of the sounds usually employed in testing are extremely variable; moreover, audibility varies with the acoustic properties of the room or even with the weather, and is greatly altered by the presence of any extraneous sounds, so that it is not surprising that clinical tests fall very far short of scientific accuracy. But in practice they are sufficient for diagnosis in the light of our present limited knowledge of otology.

Tests of Acuity.

Tests of hearing are partly quantitative, or tests of acuity, and partly qualitative tests designed to distinguish different varieties of deafness. Of the tests of acuity the spoken word is the most valuable, for the deaf patient desires improvement in the hearing for speech rather than for any kind of clicks or musical tones. It is noticeable that the hearing for speech does not necessarily correspond in degree to that for simple sounds, some patients hearing speech better than the watch or acoumeter, and some, unfortunately, worse.

The Voice.—In testing the hearing for speech the "conversational" voice is employed, and the volume of sound can be made more uniform if the lungs be first emptied of air by a deep expiration. The patient is seated with the ear to be tested turned towards the examiner, and the other ear closed by the moistened little finger in the meatus, or by inserting a plug of damp cotton-wool and pressing the tragus over it. The patient is asked to repeat what he hears while the examiner stands at the far end of the room, speaks in a uniform tone and gradually approaches until the words are heard correctly. It is best to use simple words and numerals, and to avoid the sibilant consonants, which carry a long distance. For very deaf patients "loud" speech must be employed, uttered with the lungs expanded, but it is very much more difficult to keep the loudness uniform.

For patients who are not extremely deaf it is better to test with the whisper, a quiet or gentle whisper being employed rather than the forced or "stage" whisper. This can be more easily kept constant than the voice and is more suitable in a consulting-room of ordinary size. The test is carried out in the same way as with the conversational voice. The normal distance for hearing the tests varies enormously with the conditions, as is shown by the fact that one authority gives the normal for the voice at about 20 to 30 ft., and for the whisper at 20 ft., whereas another states that whispered speech can normally be heard at a distance of 22 to 27 yards.

The *watch* is even less accurate as an instrument for estimating the degree of deafness, for the loudness of the tick varies enormously in different watches. The tick becomes weaker as the watch runs down, and it should therefore always be wound up just before testing. The note of the tick is a more or less musical one and of a rather high pitch, and is therefore relatively less well heard in cases of nerve-deafness with loss of hearing for high tones. In spite of these drawbacks it is much used, for it is a most convenient method of testing moderate degrees of deafness in a room of average size, and is particularly useful for measuring improvement after such treatment as inflation. The watch should always be taken out of reach and approached to the ear until it is heard, the eyes of the patient being closed; if two or three trials be made and the patient always signifies that he hears it at the same point it is certain that he is answering accurately. The "normal" distance for the particular watch should be ascertained beforehand, and should always be given in reports on the hearing; this is usually expressed as a fraction—e.g., W. $\frac{12}{60}$, which implies that a watch normally audible at 60 in. is heard at only 12 in. from the ear.

The *acoumeter*, designed by Politzer, produces a click by means of a small hammer which falls by gravity from a constant height on to a bar. The sound so produced is nearly uniform and is less high-pitched and musical than that of most watches; it is also louder and can be heard by a "normal" ear for about 15 metres, or 50 ft., and is therefore not suitable for testing slight degrees of deafness in an ordinary room, but it is very useful in the examination of the more severe cases. Like the watch, it should be gradually approached to the ear to be examined, and the result expressed as a fraction of the normal—e.g., $\frac{5}{50}$ ft., but, as it is a standard instrument, the distance only is often given, in which case the normal distance of 50 ft. should be remembered.

Galton-Edelmann Whistle.—The extreme range of perception of tones for the human ear may be taken to be from 16 to 40,000 double vibrations a second, but the higher part of the scale is inaudible to many otherwise quite healthy ears, and the upper limit should not be considered pathological unless it falls below 16,000. The lower limit may be tested by tuning-forks, while the upper limit is usually examined by means of the Galton-Edelmann whistle, in which the wind is produced by a small rubber ball, and the pipe lengthened or shortened by an extension worked by a screw; a scale is attached and the reading taken at the upper limit of audibility. The scale is an arbitrary one, the smaller readings indicating the higher pitch; the normal limit is at about 0·4 to 1·0, it falls with advancing age, and is usually between 1·5 and 2·0 by the age of 60.

The *monochord*, in which the note is produced by a stretched steel wire, is more accurate, but more difficult to use. In both cases the opposite ear must be tightly plugged.

Tuning-fork tests are both quantitative and qualitative. As the length of time during which a fork sounds depends upon the force with which it is struck, it is useless to measure the time for which it is heard; but the loss of hearing for a particular note can be estimated with some degree of accuracy by measuring the length of time that it is heard by the normal (observer's) ear after it has ceased to be audible to the patient. The fork must be so designed and used as not to produce overtones, should be held at a uniform distance of about two inches from the ear, and with the prongs in a line with each other to the ear examined;

if it be held obliquely interference will diminish the intensity of the sound. This is the test of air-conduction (A.C.). A large range of forks is available for special purposes, but for clinical work three are sufficient—C^0 128 double vibrations (d.v.) a second, C^2 512 d.v., and C^4 2048 d.v. The deficiency of hearing in the ear being tested is expressed by such a formula as C^0–30, which implies that the normal observer hears the C^0 tuning-fork for 30 seconds after it has ceased to be audible to the ear under examination.

Bone Conduction Tests.—The hearing by bone-conduction (B.C.) is examined in a similar manner, the base or foot-plate of the fork being pressed firmly over the antrum of the ear examined and transferred to the same region of the observer's ear as soon as it ceases to be heard, and the result stated, as B.C.—20. If, however, it be not audible to the observer, it is next applied to his own mastoid first, and transferred to the patient's when no longer heard, the number of seconds of increased bone-conduction being noted—e.g., B.C.+15. If the examiner's and patient's results coincide this may be written as "(C^0) B.C. normal," or B.C.±. The name of Schwabach is associated with this test, which is sometimes written "Schwabach—20," a quite unnecessary complication.

Qualitative Tests.

Weber's test is the comparison of the bone-conduction of the patient's two ears; the tuning-fork is placed on the middle line of the forehead or vertex, or on the upper teeth, and the patient asked in which ear it sounds more loudly. The result is entered "Weber to R." or to L., as the case may be. In the early stages of otosclerosis and in cases of acute catarrhal otitis with fluid in the tympanum, there is generally absolute increase of bone-conduction, and in unilateral cases Weber's test is strongly lateralised in the direction of the affected ear (see chart below).

Rinne's test is the comparison of the air-conduction with the bone-conduction of the ear under examination. The tuning-fork is first held to the meatus and transferred to the mastoid as soon as it ceases to be heard; if it be not audible there, the test is reversed by placing the fork on the mastoid first and, when the sound has faded away, to the meatus. Rinne's test is said to be positive when the fork is heard for a longer time by air- than by bone-conduction, and negative when heard on the mastoid after it has ceased to be audible at the meatus. The result may simply be written R.+ or R.—, but it is more complete if the difference between the audibilities by the two paths be noted in seconds, as R.+15, or R.—10, and in accurate work the fork used for testing should be noted, as C^2 R.—10, for bone-conduction is relatively stronger with the lower tones, and Rinne's test may be negative with the C^2 fork, while still positive with the C^4 fork; it is rarely negative with C^4. If the audibility by the two paths is equal the result may be written R.±.

Rinne's test is positive in the normal ear and also when deafness is caused by any lesion of the perceptive apparatus, either in the cochlea, the auditory nerve, or the brain. On the other hand, with any obstruction to the conduction of sound to the cochlea, bone-conduction is relatively, and sometimes absolutely, increased, with the result that Rinne's test tends to become negative. This happens whether the obstruction be in the middle ear or in the meatus, and may easily be shown experimentally in a normal person by blocking the meatus with the finger. As the test is positive in the healthy ear, it is obvious that it will remain positive in the slighter degrees of obstructive deafness, and only become negative when the deafness has reached a certain degree of intensity. It is usually very markedly negative in the earlier stages of otosclerosis, and in cases of acute catarrhal otitis with fluid in the tympanum. But in deafness of long standing, due to chronic "dry" catarrh or to otosclerosis, secondary degeneration of the cochlea occurs, bone-conduction becomes diminished, and Rinne's test may even be positive. In many cases too, the cochlea is affected irregularly, so that "islands" of relatively good hearing remain in various parts of the scale. Typically, the principal types of deafness show definite characteristics.

The following chart shows typical results in various conditions.

	Normal ear.	Abnormal ear.		
		Nerve-deafness.	Middle-ear deafness.	Otosclerosis.
Voice	40 ft.	5 ft.	3 ft.	2 ft.
Whisper ..	20 ft.	2 ft.	2 ft.	2 ft.
Watch.. ..	$\frac{60}{60}$	$\frac{2}{60}$	$\frac{12}{60}$	$\frac{18}{60}$
Acoumeter..	50 ft.	4 ft.	4 ft.	4 ft.
Galton ..	0·5	4·2	0·5	0·5
A.C. C^2 ..	=	—10	—30	—60
A.C. C^4 ..	=	—30	—5	±
C^4 B.C. ..	=	—20	—5	+5
Rinne	+15	+20	—10	—50
Weber.. ..	..	to R.*	to L.	to L.

* It is here assumed that the right ear is the normal one.

Tests in Relation to the Nature of the Lesion.

In *nerve deafness*, which includes the deafness of old age, hearing is most diminished at the upper end of the scale, bone-conduction is very markedly lessened. Rinne's test is positive, and with Weber's test the fork is heard more loudly in the better ear; hearing is best in a quiet room, and is relatively better for the voice than for the watch; the drum and Eustachian tube are normal, and there is no improvement after inflation.

In *middle-ear deafness*, on the other hand, the hearing is better for high than for low tones, bone-conduction is relatively and often absolutely increased; Rinne's test is negative and Weber's is lateralised to the affected ear, the watch is heard better than conversation, and in some cases hearing is noticeably better in a noise, as in a railway carriage—a phenomenon termed "paracusis Willisii; the drum-membrane shows changes such as retraction and thickening, the Eustachian tube is variously obstructed, and inflation gives improvement.

Otosclerosis gives results similar to those of middle-ear deafness, but in the early stage the departure from the normal is very marked; there is very decided loss for low tones, bone-conduction is definitely increased, Rinne is strongly negative, and paracusis very noticeable to the patient; the drum shows little or no abnormality, the Eustachian tube is healthy, and inflation does not improve hearing. In the later stage of otosclerosis, when there is degeneration of the cochlea, the results of tests approximate to those of nerve-deafness, and in very advanced cases it may be impossible to distinguish the two by examination alone.

Conclusion.

The object of these tests is, of course, quantitatively to estimate the degree of deafness, so as to be able to measure improvement under treatment, or, on the other hand, the gradual deterioration of hearing with the progress of the disease; qualitatively the tests are used to assist in the diagnosis of the nature of the lesion producing the deafness. In some cases the results of testing are simple and straightforward, but in many they are anomalous. A diagnosis should only be made after taking other factors into account, such as the appearance of the drum-membrane, the condition of the Eustachian tubes, and the result of inflation.

BELFAST SAMARITAN HOSPITAL.—An extension of this hospital was opened on Friday in last week by Princess Mary, who expressed her appreciation of the additional provision now made for women patients.

WILLIAM MACKENZIE MEMORIAL MEDAL.—On Oct. 9th, at the Glasgow Eye Infirmary, Dr. A. Maitland Ramsay was presented with the first medal to be given under the recently created William Mackenzie Memorial Fund for original research in ophthalmology.

Special Articles.

THE INSTITUTES OF MEDICINE.*

BY J. J. R. MACLEOD, M.B., D.Sc., LL.D., F.R.S.,
REGIUS PROFESSOR OF PHYSIOLOGY IN THE UNIVERSITY OF ABERDEEN.

IT was not until about the middle of the nineteenth century, some 75 years ago, that the scope of medical science became so widened as soon to make it evident that laboratory courses other than those in anatomy should form part of the medical curriculum, and chemistry, chiefly inorganic, was the first to receive attention. But soon the necessity for courses in other subjects became apparent. The details of anatomical structure, revealed by the microscope, the relationship of micro-organisms to sepsis and infectious diseases, brought to light through the researches of Pasteur and Lister, the study of the circulation of the blood and of the functions of the muscles by application of the precise methods of physics, and the unravelling of the mysteries of digestion and nutrition by those of chemistry, demanded that provision be made to instruct the medical student in the principles of these sciences and to give him some practice in the use of the methods which they employ. New laboratory courses demanding much of the student's time have thus from time to time been added to the medical curriculum, until to-day it is overburdened with detail, ill-adjusted in the relationship of one course to another, and poorly designed to emphasise the importance of combining scientific reasoning with clinical experience.

These preliminary remarks may serve to indicate the scope of what I have chosen as the subject of my inaugural lecture. I am to venture to place before you what I believe should be the guiding principles underlying the plan of instruction in the science courses of the medical curriculum, and more especially in that group of subjects which, under the title of the Institutes of Medicine, or Physiology, comes under my immediate charge.

Aim of the Medical Course.

At the outset, then, let us consider the aims and purpose of the medical course. These are, in the first place, to make the student familiar with the already known principles of medical science, and to train him in the use of its most approved methods, and in the second to prepare his mind so that he may continue to be a student throughout his professional life and thereby be competent to add something which will be of value in the alleviation of human suffering. Every medical practitioner should have a certain familiarity with the methods of scientific research, and to gain this the medical student should be encouraged to approach the clinic with the viewpoint that each patient presents a problem susceptible to investigation by the methods of science. He will then soon find out in how far this method can assist him, and in how far he must fall back on experience, for it must ever be borne in mind that the practice of medicine is an art as well as a science. A knowledge of science must not be regarded merely as the foundation upon which an understanding of disease is to be erected, as something built in the past and hidden out of sight, with no other function than to serve as a support for the main structure of medical knowledge. It is much more than this; it enters into and is an integral part of the structure itself. It is its framework, into which all that is added must fit.

It is sometimes considered that research in medicine can be successfully pursued only by highly trained specialists provided with elaborate equipment and devoting all of their time to such work. Nothing could be more fallacious. On the contrary, the general practitioner is constantly face to face with research problems which he alone can solve. He is the only one who comes in contact with disease in its early stages, and it is here that close observation of symptoms and the critical study of the effects of treatment are much needed, indeed are essential, for the advancement of medical art and science. Prevention is better than cure, but how, it may be asked, can we prevent unless we know the true significance of the earliest symptoms. It is to the general practitioner that we must look for guidance here, and his competence to furnish it will be greatly enhanced if he be familiar with those same methods of thought which have enabled his colleagues in the clinic and the laboratory to achieve success in their more highly specialised and therefore more easily explored fields of research. The two groups must work hand in hand, which can be done provided only that each knows what the other is doing with regard to both problems and methods, and it is while he is in the medical school that the future practitioner must be made familiar with the methods of scientific research. This does not mean that the medical student should be required to undertake the investigation of some unsolved problem by himself, but it does mean that he should be shown in laboratory and lecture theatre how research work is done and how its methods can be used to advantage in bedside practice.

In placing emphasis on these aspects of medical education I am fully aware that there are but few who are possessed of those rare gifts, the inquiring habit of mind, and the urge to seek for new truths that are necessary for success in unmasking the closely guarded secrets of nature. But many even of those few who are in possession of those gifts will fail to develop them unless they be guided aright, and their classfellows will lose nothing, but rather will gain much, by being trained in principles rather than crammed with facts and details.

The problem of medical education therefore resolves itself into providing instruction so that the student, besides acquiring a working knowledge of the essential facts and principles that have been handed down through the experience of others, may also develop the faculty of self-education and become sensible of his responsibility to continue a student throughout his professional life. When we analyse the present-day curriculum in medicine we find that the training in science is practically confined to the first half of the course. It is not continued, except casually, through the clinical years, with the result that physiology and its allied subjects, and the sciences upon which they depend, have come to be regarded by many, not as the Institutes of Medicine, but merely as some sort of temporary scaffolding which can be torn down and cast aside without detriment to practice.

The Study of Animal Function.

Having spoken in a general way of what I consider to be the principles underlying the framing of the medical curriculum, let me now speak in detail of how I think these principles can be carried into effect in the courses in physiology. The greater part of this subject may be defined as the application of the known laws of physics and chemistry to the study of animal function. Familiarity with the main principles of these two sciences, as well as a knowledge of the structure of the body, is therefore essential before the study of physiology can be profitably pursued. This dependence of physiology on pure science becomes more and more evident as our knowledge expands, and it may not be out of place if I cite some examples from the experience of recent years in illustration. An understanding of the mechanism of the action of the heart has depended on developments in electricity. This has given us the electrocardiograph, by which the changes in electrical potential accompanying each heart beat can be recorded and measured, their significance studied, and the alterations in abnormal heart action understood. As a result of these researches the physician has been put in possession of

* Being an Inaugural Lecture (slightly abridged) as Regius Professor of Physiology at the University of Aberdeen, delivered on Oct. 9th, 1928.

methods by which he can determine with much greater precision than hitherto the extent of damage to the heart's action, and can follow more accurately the effects of treatment. The movements of the alimentary canal which are essential in the digestion of food have only recently come to be understood, through application of the X rays, and everyone is familiar now with the immense value which this knowledge has proved to be in the diagnosis of abdominal diseases. The marvellous influence of sunlight on growth and on the general well-being of animals has required for its discovery familiarity with the physics of light, and the great expansion of knowledge concerning the reaction of the blood and the regulation of breathing has depended on an understanding of the physical chemical laws of solutions.

These are only a few of the recent applications of physics in physiology and medicine; instead of multiplying them let me refer to some which chemistry has furnished. Dietetics has become elevated to the dignity of a science, through the discovery of the chemistry of the proximate principles of food, the proteins, the fats, and the carbohydrates, and the laws which govern growth and nutrition and energy production can now be investigated by accurate quantitative methods. It is as an outcome of researches in this field that we have come to learn of the importance of vitamins and of inorganic salts as factors in nutrition, and I need scarcely remind you that it was by close calculation and scientific adjustment of the dietetic requirements that it was possible during the war to maintain a tolerable state of health in beleaguered countries and communities. Scurvy has practically disappeared, beri-beri is becoming rare, and rickets should soon become practically unknown. It is to the chemist also that we must constantly look for guidance in unravelling the intricate series of changes by which the absorbed foodstuffs are prepared for utilisation by the organs and tissues. This is known as the metabolism of the body, and many of the diseases of adult life, such as diabetes and gout, have been shown to be due to disorganisation of the chemical processes upon which this metabolism depends. Without a knowledge of chemistry work in this field is impossible.

It is evident, therefore, that the course in physiology should be designed so as to show the student how the facts of physics and chemistry find their application in understanding animal function. He must be made familiar not only with what of importance has already been discovered, but also with the experimental methods by which the discoveries have been made. Merely showing him the finished picture is of little value compared with letting him see how it is painted, or better still, with giving him the opportunity to try to paint it for himself. If he learns something of the steps to be followed in investigating the mysteries of normal function he will be in a favourable position to make use of his knowledge of physiology when he comes to the bedside to study abnormal function.

Educational Value of Experiments.

Assuming, then, that the student is well grounded in biology, physics, and chemistry, what should be the nature and content of the course in physiology? At the very beginning provision must be made for allowing the student to perform experiments by himself. These should be carefully selected and organised for the purpose of illustrating the possibilities of the experimental method, rather than for yielding results that are in themselves of importance. A few well-selected experiments faithfully performed have a much greater value than many that are hurried through in a perfunctory manner. The objective is to make the student familiar with the procedure that must be followed in the solution of typical problems in physiology, so that he may be able to understand *how* the truths of the science have been discovered. To attempt, as some instructors have done, to provide experiments illustrating all the facts of physiology which the physician must know, is of little value compared with having the student carry through a few typical experiments thoroughly. He can then soon learn the facts.

It really does not matter very much what experiments are chosen, so long as they illustrate the principles upon which discovery depends. The earlier ones should be as simple as possible, and for this purpose nothing could be better adapted than the nerve muscle preparation and the heart of the frog. The advisability of requiring medical students to perform experiments on frogs' muscles is sometimes questioned on the ground that the results can be of no so-called practical value. For a physician this is the wrong view to take. It is not because of the results themselves that the experiments are performed, but because the experiments introduce the student to the quantitative study of animal function, and teach him something of the behaviour of living as compared with dead matter. In physical science the experimental conditions are under control, and the results can be stated in terms of mathematics; they are more or less predictable, but in physiological science, living structures being concerned, many of the factors are beyond control, and it requires experience to interpret the experimental results correctly. Experiments must often be repeated many times with modifications before any conclusion can be drawn from the results. The experience gained in the physiological laboratory prepares the student's mind to analyse the causes responsible for the symptoms of disease, besides, of course, training his hands to carry out measurements of precision, which may give him useful information for diagnosis and for treatment.

After he has made a beginning with these simple experiments the student is in a position to be taught the principles and facts of physiology. He can now follow intelligently the steps in the experimental proofs by which these have been brought to light, and can attend a course of lectures and use his text-books with profit. It seems to me that it would be just as hopeless for an engineer to try to become efficient in understanding the working of a piece of machinery solely by reading books and listening to lectures as for a medical student to understand the workings of the body by similar methods.

Fundamental principles having been grasped and some practice had in drawing conclusions from experimental results, the student can appreciate the work of others and can form his own opinion as to the value of the evidence which is offered as proof. The theories and even the so-called laws of science are not final; they are merely the scaffolding from which a permanent structure of final knowledge is slowly built up, and it is only by actual experience in experimental work that the student can acquire this point of view. If he does not acquire it he will become bound by authority, a mere copyist of others, and can never develop that inquiring habit of mind which is essential to real success in the practice of medicine.

Side by side with the didactic instruction experiments on man himself should occupy the hours allotted to the laboratory. There are many of these which have a high value in training the mind, and besides are excellent in illustrating the fundamental laws of physiology. Practical studies of the heart beat, the pulse, blood pressure, and the air of the lungs, both in conditions of bodily rest and after muscular exercise, forced breathing, holding the breath, to mention only a few of the experiments which may be performed, introduce the student to the use of methods of measurement which he may use with profit in the examination of the patient, and his efforts in interpreting the results afford opportunity to test the laws which govern the circulation of the blood, breathing, and the control of the acid-base equilibrium of the body. Then some time must be spent in the study of the nerve reflexes and the special senses. Unless he is thus made familiar with the normal, how can the student expect to be able to detect abnormal function?

Training for Research.

So far I have confined my remarks to the training in physiology of those intending to be medical practitioners, and I have said nothing regarding the training of those who may wish to study the subject for its own sake, or to enter research either in this or some other domain of science. There are two groups of such students: (1) medical students, and (2) B.Sc. students. Let me first of all consider the needs of the former group.

In an average class there are usually two or three students who show special aptitude for scientific work and to whom opportunity should in some way be given so that they may get far enough to enter into unexplored fields of research in the fundamental sciences of medicine. The advantages of encouraging such students in this work are many, even for those who may ultimately go into practice, for not only will they acquire a practical working knowledge of methods of thought, as well as of manipulation, which will be of immense advantage in clinical work, but the critical judgment will be more developed, the knowledge of what science can do in the study of disease will be deepened, and the man thus trained will be in a much better position than the average medical student to carry out investigations in the clinic or in practice, which will add to our knowledge of the causes and treatment of disease.

This special training of research men cannot, of course, be undertaken as a part of the regular medical course, but in Aberdeen a beginning could be made by offering facilities during the summer months and by establishing one or two modest scholarships to enable a year to be spent in the laboratory. This could be done either after the second professional has been passed or after graduation. I can state as a result of experience that such a scheme is of undoubted advantage, not only to the student himself, but also to the university, in that it augments the output of research and engenders a spirit of inquiry in the minds of the other students, and thereby increases their interest in their studies.

With regard to research for science students provision has already been made by which those in science may take physiology either as a major or a minor subject. This is an excellent scheme and one which I will always take much interest in developing. Research in physiology as well as in medicine demands nowadays the team-work of many workers. The problems are so involved and the necessary measurements are so time-consuming that there are few which can be solved without collaborative effort.

Interdependence of Physiology and Medicine.

During recent years much has been heard of the desirability of a closer integration of the scientific and clinical subjects of the medical curriculum. The pioneer framers of this curriculum had clearly in mind the essential interdependence between physiology and its sister subjects and clinical instruction when they styled it the "Institutes of Medicine," but for various reasons a sharp line of demarcation has drawn itself between the two, and the clinical instructor finds it difficult to induce the student to utilise his knowledge of physiology to full advantage. This is a problem which is occupying the attention of medical instructors, for it requires no close analysis of the advances in medicine during recent years to see that a large proportion of them have been achieved very largely by the application of physiological and biochemical methods. The budding doctor should certainly not be allowed to enter on his life work in practice with the idea that the physiology and other scientific courses which occupied his earlier years at the medical school are of little practical value and were only tiresome stepping-stones to the clinical platform. He should, on the contrary, be made to realise that his success in keeping abreast with the times in his profession, whether as general practitioner or as specialist, depends on his remaining a student of the Institutes of Medicine, so that, as new principles of function come to be discovered, he may be in a position to seek their application in clinical practice. In my experience the most successful way by which this problem in medical education can be solved is by having a few lectures on applied physiology in the last year of the medical course, by holding joint discussions between the clinical and laboratory instructors of problems dealing with disease, and by having as instructors in the clinics at least a few who have spent a year or two in research work in the laboratories. I do not believe that every clinical specialist should necessarily have served an apprenticeship in purely scientific research, but I am convinced that the advantage of having some men so trained on the clinical staffs of our hospitals is of incalculable benefit both for the welfare of the patients and for the instruction of the medical student.

Finally, let me say that although physiology and biochemistry and their related subjects are properly styled the "Institutes of Medicine," and must ever form the basis of a sound training for the practising physician and surgeon, they are also sciences by themselves, self-contained fields of knowledge of wide human interest, and with many other applications than in that of the study of disease. They should therefore occupy an important place in the organisation of every university.

BIOCHEMICAL DIAGNOSIS OF PREGNANCY.

THE NEW HORMONE TEST.

It would be very useful to have a simple test for pregnancy, which would definitely indicate its presence or absence, and the hope of finding one has inspired much work of late years, especially in Germany and America. As a result, many tests have been devised which seemed to solve the problem completely when they were first described, but their practical value has not been confirmed.

These reactions have, in the main, been based on two ideas; either upon the specific ferment theory of Abderhalden, which postulates the appearance of a specific protein in the blood during pregnancy, or upon a study of the production of glycosuria in the person undergoing the test. Perhaps the best known of them is the Abderhalden reaction,[1] but investigators in various parts of the world have reported that they have been unable to get satisfactory results by any of the numerous modifications in which the technique has been presented from time to time, and Smith and Shipley[2] state definitely that the test is of no value for the diagnosis of pregnancy. The epinephrin-glycosuria test,[3] Kamnitzer's phlorizin test,[4] the dextrose test and the red cell precipitation test of Fahraeus[5] have all been declared to be of little or no practical value as tests for pregnancy. Interest is at once aroused, therefore, when a test appears which is based upon a new or little investigated principle.

Our knowledge of the hormone which is variously described as the ovarian hormone, the œstrus-producing hormone, œstrin, or the female sexual hormone, has increased very greatly during the last few years, thanks to the work of Allen and Doisy and others. The presence of this hormone has been held to be associated with the growth of the uterus and increased development of the breasts occurring in pregnancy; and a report of enlargement of a mouse's uterus resulting from the injection of blood from a pregnant woman was published in 1924 by Binz.[6] Frank[7] detected the presence of the hormone in the blood of non-pregnant females, fluctuating in correspondence with the normal menstrual cycle. The same author (loc. cit.) and also Fels,[8] Aschheim,[9] Trivino,[10] and Siddall,[11 12] have found that the amount of the ovarian hormone in the blood during pregnancy shows a great increase, which disappears shortly after the uterus is emptied.

Since, according to these observers, the hormone makes its appearance soon after conception, it is

evident that the demonstration of its presence in the blood might be made the basis of a test for pregnancy. There have been two main obstacles to the application of this method: first, the practical difficulty of evolving a technique for demonstrating the presence of the hormone and its approximate amount; and, secondly, the establishment of the validity of the method, which would clearly require a very large number of control experiments upon pregnant and non-pregnant, normal and pathological subjects. The qualitative demonstration of the presence of the hormone had been studied for many years, since the experiments of Fellner[14] in 1913 showed that extracts of placenta and of the female sexual organs were able to bring about uterine growth in immature ovariectomised animals, and similar results were obtained in normal immature animals by Hermann[15] two years later. These observations have since been repeated many times and, whilst it cannot be said that this type of method is entirely satisfactory, it is nevertheless a useful indication of the presence of the hormone. The specificity of methods depending upon increase of growth of the uterus is, however, disputed by Zondek,[16] who states that increase of growth alone is a very uncertain criterion of the presence of the hormone. Nevertheless, they have been commonly used by scientific workers for some time and, together with the later methods based upon a study of the vaginal smears of immature or ovariectomised animals, have been of very great service.

In two recent papers by Siddall,[11 12] the application of this work to the diagnosis of pregnancy is investigated. The patient's blood is taken, is allowed to clot, and the serum, which is kept in a sterile tube in a refrigerator, is injected daily in doses of 1 c.cm. into an immature virgin white mouse. On the sixth day the animal is killed and is weighed; the uterus and the ovaries are dissected out in one piece free from their attachments, and are accurately weighed; the ratio of the mouse weight to the combined weight of the uterus and ovaries is calculated and this ratio is used for the diagnosis. If this ratio is less than 400 to 1 the test is considered positive; if more than this, the test is negative. The size of the ovaries is also considered as supplementary evidence if the mouse is not too young. The author gives a summary of the results in 142 cases examined, of which nine only were erroneous. In 19 tests on women less than three months pregnant one erroneous result was obtained. The table, however, includes a number of males (one positive result), and it may be relevant that many of the patients examined belonged to black races.

These results show that the test has considerable potentialities, which can only be truly assessed by a continued and fuller investigation. At this stage we may return to the work of Zondek and Aschheim. In a recent paper[13] these authors consider in detail a method that they first described earlier in the year.[17] Zondek's view is that the ovarian hormone is a secondary one, produced by stimulation of the ovary by the hormone of the anterior lobe of the pituitary, and that this is the mechanism whereby the ovarian hormone is set free. They have shown, for example, that transplants of the anterior pituitary lobe produce very marked effect on the ovary, particularly in the number and size of follicles and corpora lutea, and they claim to have produced an aqueous extract from the anterior lobe that will bring about a similar result. Such extracts have no effect upon ovariectomised animals. This observation seems to shed a great deal of light on the problem. It has been shown by Loewe[18] that the urine of women also contains small quantities of a hormone which, when injected into mice, will bring about changes in the ovaries and uterus which have generally been associated with the ovarian hormone. According to Zondek and Aschheim the ovarian hormone is accompanied by the anterior pituitary hormone; but whilst the ovarian hormone is excreted in the urine of both pregnant and non-pregnant females, and, according to Laqueur,[19] even of males, the commencement of pregnancy is quickly followed by an "explosive production of anterior pituitary hormone, the inundation of the blood with the hormone and its excretion in the urine" (Zondek, 1928). The detection of the hormone is based upon the anatomical examination of the test animals, and the demonstration of the presence of hæmorrhagic centres and of corpora lutea in the ovaries, following the injection of the patient's urine. Five mice of from three to four weeks old, whose weight is between 6 and 8 g., must be used for each test; 6 doses totalling 1·2 to 2·4 c.cm. are given to each mouse, the period of injection extending over 48 hours, and on the fifth day the mice are killed and their ovaries are examined. Under these conditions Zondek claims that the test is specific for the anterior pituitary hormone, and that direct injection of urine, other than that from a pregnant female, will not cause these changes, since in these cases the anterior pituitary hormone is present in traces only. In this respect Zondek claims that the test is superior to that depending on the presence of the ovarian hormone because, besides pregnancy, functional ovarian disturbances such as the climacteric and "hyperhormonal amenorrhœa" can cause the excretion of large amounts of that hormone in the urine. On the other hand, the demonstration of the anterior pituitary hormone in small quantities (1·2 to 2·4 c.cm.) of the urine, by Zondek's method and technique, is claimed to be a specific biological test for the early diagnosis of pregnancy, actual or only recently terminated.

Aschheim[20] gives the results obtained from a large number of cases. Of 258 control urines examined, 1·6 per cent were positive, whereas of 197 specimens of urines from normal pregnancy only 4 gave a negative response. If these results are confirmed by other workers it is clear that they will prove to be of very great value to all those who are concerned with the diagnosis of pregnancy.

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THE LONDON MEDICAL EXHIBITION.

(*Concluded from p. 777.*)

MILK AND FOOD PRODUCTS.

THE WEST SURREY CENTRAL DAIRY CO., LTD. (Cow and Gate House, Guildford, Surrey), demonstrated various preparations of dried milk, their now well-known "Cow and Gate" Brand being produced under conditions which ensure the full dietetic value with strict attention to hygiene. Half Cream, Full Cream, and Lacidac which contains lactic acid were shown as well as Brestol, a humanised cream.—GLAXO (56, Osnaburgh-street, London, N.W.) displayed their Ostelin, which is a physiologically standardised concentrate of vitamin D; Ostelin

in glycerine, four drops being the equivalent in vitamin D value to 1 drachm of cod-liver oil; Ostomalt, Ostelin tablets, and Ostelin emulsion. Ostelin ampoules, elixir Ostelin, and Ostelin with parathyroid tablets were also shown.—HORLICK'S MALTED MILK CO., LTD. (Slough, Bucks). The malted milk of this firm has a high vitamin content, and in addition to ordinary diet forms an efficient invalid food. Malted Milk Toffee was also shown.—TRUFOOD, LTD. (Creameries, Wrenbury, Cheshire, and Lever House, Blackfriars, London), showed Humanised Trufood for infants, which is claimed to be practically identical with breast milk, their Full Cream milk product for infant feeding from 9 months onward, and for nursing mothers and invalids, and Secway, whey in powder form.—NESTLÉ AND ANGLO-SWISS CONDENSED MILK CO. (6 and 8, Eastcheap, London) called attention to the scientific care and control under which their milks are produced. These included full cream sweetened condensed milk, milk food prepared in powder form, "Ideal" milk, unsweetened, and Thick Cream, free from preservatives.—HOVIS, LTD. (London, Manchester, Macclesfield, and Bristol), demonstrated the process of converting wheat into flour and the advantages of their process of making Hovis bread which has a large vitamin B content.—ENERGEN FOODS CO., LTD. (Energen Works, Willesden, N.W.), drew attention to their standardised bread, biscuits, and cereals. The bread, which is in the form of batons, rolls, loavettes, and rusks, has constant carbohydrate and protein proportions, thus enabling the doctor to prescribe and adjust a dietary with precision.—BRAND AND CO., LTD. (Mayfair Works, Vauxhall, London), showed a number of invalid food specialties, including their essence of beef and chicken; Brand's Meat Juice, in which the albumin is retained in an uncoagulated form; Ferrocarnis, an iron tonic food; liquid peptone, a new pre-digested liquid food prepared from beef and barley malt; and calf's foot jellies of varying flavours.—BOVRIL, LTD. (148–166, Old-street, London, E.C.), showed their now well-known Bovril and Invalid Bovril, the latter of which is a special form without seasoning, is more highly concentrated, and has a greater albuminoid content.—OXO, LTD. (Thames House, Queen-street Place, London, E.C.), showed their various preparations, including Oxo in fluid and a solidified form as cubes, and Hospital Oxo, which is specially prepared for invalids and is peptonised and unseasoned. The stall also prominently exhibited "Oxoid" endocrine preparations in variety, and "Liveroid," liver juice for the treatment of pernicious and general anæmia. Lemco and Tab Lemco, as well as a preparation of the natural juice of fresh lean beef, containing soluble uncoagulated proteids, were also shown.—CADBURY BROS., LTD. (Bournville), exhibited their various preparations of cocoa and chocolate. Every half-pound of Dairy Milk chocolate contains the equivalent of one and a half glasses of full cream English milk.

MISCELLANEOUS.

THE DENVER CHEMICAL MANUFACTURING CO. (London, E.) displayed the well-known Antiphlogistine, an hydroscopic, antiseptic poultice for use in superficial and deep-seated inflammatory and congestive conditions.—PASTILLES, LTD. (124, High-street, Shoreditch, London, E.), exhibited the Lakerol Brand Bronchial Pastilles, which are useful for those who have to use their voices extensively.—J. C. ENO, LTD. (Pomeroy-street, London, E.C.), demonstrated the pleasant, effervescent saline laxative, Eno's "Fruit Salt."—KEEN, ROBINSON AND CO., LTD. (Carrow Works, Norwich), made a feature of Almata, a complete food for infants; Robinson's Patent Barley, Groats, and Waverley Oats, and Keen's Mustard Ointment.—THE THERMOGENE CO., LTD. (Hayward's Heath, Sussex), exhibited Thermogene, a medicated wadding which acts as a skin stimulant.—THE JAEGER CO., LTD. (95, Milton-street, London, E.C.), displayed their pure wool clothing

THE MEDICAL SICKNESS, ANNUITY AND LIFE ASSURANCE SOCIETY, LTD. (300, High Holborn, London, W.C.), which was founded in 1884 to enable doctors and dentists to obtain sickness, accident and life assurance policies on the best terms, is managed by members of the medical profession, and the stand exhibited the many advantages which accrue from the policies issued by the Society.—THE MEDICAL AGENCY (W. H. Grant) (Watergate House, Yorkbuildings, Adelphi, London, W.C.) demonstrated the service which it renders in the buying and selling of practices and in the supplying of locum tenens.

SPAS AND WATERS.

By pictures, literature, and objects illustrating treatment, several spas demonstrated the advantages of balneological treatment. BATH, with its natural hot springs and wide variety of treatments, specially called attention to "The Book of Bath," a new official handbook elaborately illustrated, containing among its interesting features an account of the city's archæological treasures and a reprint of the Proceedings of the important Conference on Rheumatic Diseases, which was held in May last.—BRACEBOROUGH SPA, Lincolnshire, which is known for its treatment of skin affections, is now recommended for latent infections owing to the high calcium content of its water (grs. 30·39 per gallon calcium bicarbonate) in the presence of free carbon dioxide.—BUXTON, with its radio-active thermal water and strong chalybeate spring, and its variety of treatments, called attention to its drinking cure, the water from St. Ann's Well being also obtainable as a table water.—DROITWICH. At the exhibit of this spa, the baths of which have recently been extended, attention was directed to the fact that the treatment is prescribed throughout the whole year owing to the suitability of the climate. Extensive developments are in progress.—HARROGATE, which has a diversity of waters, demonstrated the utility of a radio-active mud, Fango, which has recently been discovered and which promises to be of singular value among the many treatments already obtainable at this spa.—TORQUAY CORPORATION, South Devonshire, in addition to the various British and Continental methods of treatment at their spa, advertised the magnificent sun lounge with a Vita-glass structure, 95 by 18 ft.—INGRAM AND ROYLE, LTD. (Bangor Wharf, 45, Belvedere-road, London, S.E.), who are importers and exporters of natural mineral waters, salts and pastilles, exhibited a wide selection of their wares, including the well-known Vichy-Célestins.

PRINTERS AND PUBLISHERS.

ADLARD AND SON, LTD. ("Bartholomew Press," 21, Hart-street, Bloomsbury-square, London, W.C.), who specialise in medical and scientific printing, had an interesting exhibit, some fine three-colour work, and other forms of illustration being attractively displayed. A selection of the scientific and medical periodicals and Society Transactions and reports, illustrative of their printing work, was also shown.—BAILLIÈRE, TINDALL AND COX (7 and 8, Henrietta-street, London, W.C.) exhibited a wide range of medical books, calling special attention to Baillière's "Synthetic Anatomy."—WILLIAM HEINEMANN, LTD. (99, Great Russell-street, London, W.C.), showed a new and original text by Henry MacCormac, of Jacobi's "Atlas of Dermochromes," the first volume of a series of monographs of Medical and Surgical Science edited by Prof. R. J. S. McDowall, and many other medical books of interest.—H. K. LEWIS AND CO., LTD. (136 and 140, Gower-street, and 24 and 28, Gower-place, London, W.C.), who exhibited a selection of recent and standard works for the consultant practitioner and student, called attention to their scientific and circulating library.

It should be noted that the London Medical Exhibition has now so outgrown the floor-space available at the Central Hall, that it has been decided to hold the Exhibition in 1929 at the Hall of the Royal Horticultural Society at Westminster.

GENERAL MEDICAL COUNCIL.

ELECTION OF TWO DIRECT REPRESENTATIVES FOR ENGLAND AND WALES.

Two names were selected last July by English and Welsh deputies at the annual meeting of the British Medical Association, for nomination on behalf of the Association as Direct Representatives of the registered medical practitioners of England and Wales on the General Medical Council. These were Dr. J. W. Bone (Luton) and Dr. E. K. Le Fleming (Wimborne). On their behalf the following election address has been circulated :—

At the present time two only of the members of the General Medical Council are general medical practitioners. We believe that there is a widespread feeling in the profession that such representation is inadequate, and that opportunity should be taken at this by-election to place upon the Council two Direct Representatives who have the closest possible touch with the problems and difficulties of general practice. The sphere of consultant practice is well cared for by the representatives of the various universities and licensing bodies, who, also, have done yeoman service in developing and improving medical education.

It may be, however, that the educational outlook has in the past been rather from the angle of the teacher, and that a further leaven of members engaged in family practice would assist the Council in guiding those who have the duty of preparing the medical student for a career which in the great bulk of cases is that of a general practitioner. The penal procedure, which occupies so much of the Council's time, deals often with situations arising in the lives of general practitioners. Further, the Council is frequently consulted by the various Government Departments in relation to Parliamentary Bills and to proposed new regulations. In many instances, and particularly where the National Health Insurance Service is concerned, these are matters of great moment to the general practitioner but of little interest to the teacher or consultant.

We are both in the active pursuit of our profession, and have had much experience of administrative and medico-political work. One of us (J. W. Bone) has had 32 years in general practice, private and contract, in the industrial area of Luton; has served on the Insurance Acts Committee for five years, and now has the honour to be a member of the Council of the British Medical Association and chairman of its Medico-Political Committee. The other (E. K. Le Fleming) is familiar with other aspects of private and contract practice through 27 years' work in the rural area of Wimborne, whilst in addition to serving on the Council of the British Medical Association and on the Insurance Acts Committee, he has been honoured by the confidence of insurance practitioners for the past five years as chairman of the Conference of Local Medical and Panel Committees. Our candidature has been endorsed by the English and Welsh members of the Representative Body of the British Medical Association.

Our experience in interpreting the collective views of our fellow practitioners and our willingness to devote whatever time and energy may be necessary to the proper fulfilment of the duties of a Direct Representative embolden us to solicit, not only your own vote but your active assistance in securing the votes of your colleagues.

J. W. BONE, M.B., C.M. Edin., B.Sc.
E. K. LE FLEMING, M.B., B.C. Cantab.
M.R.C.S., L.R.C.P., B.A. Cantab.

The Medical Practitioners' Union has issued an address on behalf of two Reform Candidates who are standing under its ægis—namely, Dr. E. A. Gregg (London) and Dr. Gordon R. Ward (Sevenoaks).

It is now 70 years since the General Medical Council came into existence. It is neither surprising nor discreditable that it should be found somewhat ill-adapted to modern conditions. The following defects are particularly evident: (a) The almost negligible representation of the public, for whose protection the Council exists; (b) the scarcely greater representation of general practitioners, with whose education and affairs most of the Council's work is concerned; and (c) the difficult position of the Council in disciplinary matters.

We feel that reform can best come from within and that the Council itself should prepare a schedule of reforms for the approval of the State. We believe that there will be no lack of goodwill amongst its members to this end. At the same time we cannot overlook the fact that the election of candidates definitely pledged to initiate the necessary discussions has become essential. Neither by word nor deed have our sitting members sought for reform, nor are any other candidates pledged to it.

In these circumstances, we ask that you will record your votes in our favour and afford us that opportunity of which your previous representatives have failed to take advantage. We may perhaps add that we have each given many years of service in medical organisation and public work.

EDWARD A. GREGG, L.R.C.P.I., L.R.C.S.I.
GORDON WARD, M.D.

Dr. Gregg is an Ulsterman by birth, 47 years of age, who qualified in Dublin in 1909, and whose public record is set out thus :—

He is well known in medico-political circles for his keen advocacy of the family practitioner's cause. He has given for many years both time and energy to the work of medical organisation in spite of the heavy claims of a busy and arduous practice. There is no important centre in the country Dr. Gregg has not visited frequently, travelling by night in order to eke out the time available to the utmost. He has always set forth a high standard of efficiency and service for his profession. He has consistently urged the importance of associating the practitioner with the local hospitals, public health clinics, and health services generally; claiming that the maximum result can be produced through utilising the services of the family doctor.

Dr. Gregg is an experienced public man, being an alderman and past mayor of the Metropolitan Borough of St. Pancras, and a past chairman of the St. Pancras Board of Guardians, besides holding chairmanships of public health, hospital, and other committees. He has so far refused invitations to allow his name to go forward as candidate for Parliamentary honours, although several such invitations have been tendered to him. He has served for many years on the Insurance Acts Committee. He has also been for many years a prominent member of the London Insurance Committee, and is vice-chairman of the London Panel Committee. He was one of the moving spirits in setting up a public medical service for London.

Dr. Gregg has been closely associated with the Medical Practitioners' Union since its inception, and for the past four years has been elected each year as President.

On his own behalf Dr. Ward adds—

The General Medical Council is intimately concerned with the life of the general practitioner. His education proceeds under its auspices and his daily work is governed by its rules. Nevertheless, it contains only two general practitioners to-day and has vacancies for only two more. Its constitution allows of only one-tenth of its members being elected by the profession at large. This may well have been a suitable arrangement 70 years ago but it has led of recent years to difficulties which have injured the prestige of the profession and which ought not to be allowed to recur.

The remedy is an alteration of its constitution in such manner as may seem best after proper consideration of all sides of the question. The gentlemen whose names have been put forward by the British Medical Association are anxious that they themselves shall be elected because they are general practitioners, but they do not advocate increasing the one-tenth mentioned. The sitting members, also B.M.A. representatives, have actually disavowed this policy. It is evident that these gentlemen are contented that the specialist and educational element should continue to far outnumber that of the general practitioner. They see no sign of the times in the fact that the dental and nursing professions have secured much more favourable treatment. They are, one assumes, equally content with the almost complete exclusion of representatives of the public. With this attitude I have but little sympathy. Of my own qualifications to speak for my colleagues in the profession I speak with some diffidence. I was, very long ago, one of that London Medical Committee which strove to prevent the Insurance Act coming into operation. Since National Health Insurance became inevitable I have (with the exception of nearly five years' war service) been closely associated with its various administrative aspects, as also with other medical work, local government, &c. I am a general practitioner and it is as such, and in the interests of general practitioners, that I ask the favour of your votes.

MANCHESTER TUBERCULOSIS DISPENSARY. — A Ministry of Health inquiry was held in Manchester on Oct. 11th into the proposal to transfer the corporation's tuberculosis dispensary, now situate in Hardman-street in the centre of the city, to a site in Oxford-road opposite the Royal Infirmary. The inquiry was conducted by Dr. J. E. Chapman and Mr. H. Pearson, the medical officer and architect appointed by the Ministry. During a hearing lasting from 11 A.M. until 7 P.M. evidence was given for the corporation by the medical officer of health, Dr. R. Veitch Clark, and other officials; Mr. H. D. Hudson represented a large number of ratepayers with houses and premises near the proposed site who objected to the erection of the dispensary there. The inspector intimated that after he had visited the existing premises and the proposed site a full report would be forwarded to the Ministry of Health.

MEDICINE AND THE LAW.

Liability of Motorist for Hospital Treatment.

SURGEONS on the staff of a local hospital have good reason to be aware of the fact that, as the result of traffic accidents, many patients are admitted to the hospital who have no connexion with the locality. At the Ashford County Court last month there was a decision of considerable importance as to the liability of such patients to pay fees. The decision does not present any novel extension of the ordinary law of implied contract, but it is interesting as showing the strong view taken by a particular judge in a particular set of circumstances. The action was a claim by Drs. A. and V. Don, of Ashford, for 35 guineas, against Mr. Usick, a resident at Muswell Hill, in respect of a surgical operation and attendance upon a young man of 18 who had been admitted to Ashford Hospital as the result of a motor accident. The case for the plaintiffs was that the patient had been admitted as a private patient, the hospital rules being that patients non-resident in the district should be deemed private patients, and that private patients should be liable for medical fees in addition to hospital charges although necessitous cases might be dealt with free. A charge of 13 guineas for treatment had been paid to the hospital; the receipt given by the hospital for this sum had made it clear that this charge was for treatment only and not for a surgical operation. The case for the defence was that the payment of 13 guineas was sufficient, that there was no implied contract to pay for the surgical operation, that the hospital rules had not been brought to the notice of the patient, and that the defendant had never been asked if he wanted a private ward. Dr. Alexander Don, giving evidence, said the defendant was unconscious when brought to the hospital and that it was difficult to determine the extent of the injuries at the time. He examined him on admission and operated upon him the next day when the defendant was able to communicate with his friends. Nearly the whole of the left ear was torn away and great pains were taken to get the ear to stay on the head instead of the more obvious course of taking the ear away. He continued to treat the defendant for 14 days, after which period the patient was taken home, the operation having been thoroughly successful. These facts were presumably admitted; the dispute in the case seems to have involved two questions—first, was the patient a private patient who impliedly undertook to pay a reasonable reward for the professional services he received; and, secondly, what was a reasonable charge for those services? About the first question His Honour Judge Terrell never seems to have had any doubt. If a man meets with an accident and is unconscious and a doctor attends to him for some time, is not that doctor, asked the judge, entitled to be paid? Does it make any difference, he pursued, if the man goes to a hospital. Yes, replied counsel for the defendant, because a hospital is erected by public subscription and is used for the benefit of persons who meet with injuries. There was no obligation upon the hospital, rejoined the judge, to attend to your client. On the second question it was protested on the defendant's behalf that he was not a wealthy man. It appeared, however, that he possessed two motor-cars, and that a portable wireless set had been brought to the hospital by the young man's parents, these circumstances suggesting that the family's standard of living was at any rate fair. In addition there was the fact that the defendant on his notepaper advertised himself as the "largest retailer in Great Britain for lighting, heating, and radio." The judge held that it could not be concluded that the patient was a poor boy. He gave judgment for the sum claimed, and added that the patient was very lucky to have had such a skilled surgeon to put his ear on for him.

Being the decision of a county court, the case cannot be cited as a precedent; if, however, similar facts exist, a similar decision may confidently be expected.

Frauds on Doctors and Infirmaries.

Sentence of six months' imprisonment was passed on Sept. 27th at Pontefract Petty Sessions upon Eric Ronald Cox, who was charged with obtaining money from Dr. G. Burnett and food from the local infirmary by false pretences. It was stated that the accused called on Dr. Burnett and presented a card bearing the name "Dr. Wm. Gray, M.B., Ch.B."; he said the Medical Council had paid his expenses from Switzerland as far as London, and that he wanted assistance to get to Edinburgh. The same evening he sent in his card to Dr. Barrett at the infirmary, declared that he was suffering from emphysema, and was thereupon placed in a private ward. His description of his symptoms was inconsistent, and Dr. Barrett, on becoming aware of the visit to Dr. Burnett on the previous day, asked Gray where he had spent the previous night. Gray replied that he had spent it in the Manchester Infirmary and had come to Pontefract that day. Dr. Burnett was able to identify him and the case was placed in the hands of the police. Before the bench Gray put in a long written statement, in which he stated that he had given up a good position to join the army, had been invalided out of the service without pension, suffering from tuberculosis, and had been "treated worse than a leper." He asked to be dealt with under the Probation of Offenders Act and to be given a chance which he had not yet had. His police record, however, showed a series of convictions for similar offences. An inspector said that Gray seemed to spend his time obtaining money from doctors on the representation that he was a physician whose name was actually to be found in the Medical Directory, and obtaining food and lodging at public infirmaries. After a previous sentence of six months he had abused the hospitality of the Rotherham Infirmary by taking some of its notepaper and thereon writing himself a testimonial (purporting to be signed by the medical officer) certifying that he had acted as locum-tenent there for three weeks and had given every satisfaction. He had obtained money from medical practitioners at Rotherham, Leeds, and elsewhere, and had received lodging at the Leeds Infirmary and at the Beckett Hospital, Barnsley. The accused, who appeared to be a well-educated man, described himself as articled clerk to a firm of chartered accountants at Birmingham.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

The Dublin Hospitals.

DISCUSSIONS of the problems of the Dublin Hospitals has been carried further by an article in the *Irish Statesman* of Oct. 13th. The writer believes that if amalgamation could take place economies could be effected and better service given, but he says that there is no general agreement among doctors as to what is best to be done.

"A system grew up which the younger men, and some of the older, now feel has many defects, but it has many noble traditions of public service, and it is natural that those associated with the system, conscious of the fine work done, should not desire any change, but only a better system of financing the existing institutions."

He goes on to point out that there is at present wasteful expenditure due to overlapping, and that none of the several hospitals are really complete or up to the finest modern requirements. He suggests that as voluntary efforts have failed, a Commission should be set up to inquire into the hospital system of Dublin. This Commission should include doctors from other countries such as America, England, and Germany, and before making a report or recommendations its members should have investigated hospital systems in other countries. The writer further holds out the hope that if a scheme could be agreed on, assistance might be given by the

Rockefeller Foundation for carrying it into effect. It is true that the Foundation is not interested in hospital work as a charity, but it is deeply interested both in the medical education and the research which are carried on in hospitals.

In comment on these views, it may be said that the failure so far of the scheme of amalgamation of certain hospitals is not due to differences of opinion among either the medical staffs or the boards of governors of these institutions. The staffs and the governors of five of the smaller hospitals agreed some years ago to a scheme of amalgamation if money could be found for the necessary capital outlay on a building. The scheme is still at a standstill because money has not been found. Again, on a minor point, the writer is probably unduly optimistic in looking for much saving of expenditure by the amalgamation of hospitals. There will be some, no doubt, but it will be far out-balanced by the additional expenditure which will be necessary to run an institution according to modern requirements.

An Address on Jurisprudence.

At the opening of the winter session of the Royal Victoria Hospital His Honour Judge Thompson, Recorder of Belfast, delivered an address in the King Edward Memorial Hall, at which Prof. Andrew Fullerton presided. A lawyer, said the Recorder, had been asked to give the address presumably because his orbit, like that of the doctor, touched nearly every aspect of human life; often indeed their orbits intersected, when the lawyer's knowledge and interest came into contact with the doctor's and the science of medical jurisprudence sprang into action. He asked his hearers to bear in mind that the function of the medical jurisprudent or witness was to assist the court and not merely to assist his client or patient. The qualifications of the good medical witness were medical and general, and from the point of view of the court the general qualification might be the more important. Doctors should know how people lived, how they carried on their trade, and, generally speaking, the conditions under which they lived. Suppose medical evidence was required in a case in which a man was injured by machinery. They had to make up their mind if the accident could have been caused in the way the patient told them. They must test the patient's story. A patient might describe herself as a reeler, or a doffer, or a winder. Did those words convey anything to the medical man concerned in the case? Unless they knew something about the trades they could not give advice or evidence that was worth having. How the injury was caused was of vital importance, and they must be curious about their patients and find out all about them. The extern department, said the Recorder, was an excellent school for that purpose, for there they met every day patients who had sustained injuries in every kind of work. He advised the doctor to visit the scene of accidents, to inspect the machinery himself, and thus be able to tender first-class evidence. The chief failing of the young doctor in court was in being too technical. Above all things he should be thorough. Finally, the Recorder advised punctual attendance at the court; cases had often been lost because the medical witnesses were late.

Extension of the Samaritan Hospital.

During her visit to Ulster last week Princess Mary opened the new extensions of the Belfast Samaritan Hospital, where she was received by Major-General F. F. Ready, officer commanding the Northern Ireland district, and Viscount Craigavon, Prime Minister of Northern Ireland, who is chairman of the executive committee of the hospital. A number of presentations were made to Her Royal Highness, including Miss Florence E. Henderson, president of the hospital, and Sir John Campbell, M.P., senior surgeon, Dr. W. R. MacKenzie, and Mr. T. S. Holmes, hon. surgeons. Miss Henderson, who presided at the ceremony, described the hospital as the only one in Ireland exclusively devoted to the treatment of women. Surgical work had been carried out under increasing difficulties owing to the lack of theatre accommodation; the names of StClair Boyd, one of the first surgeons to the institution, and of the late G. Adams Hicks were perpetuated in two of the private wards, while that of the present senior surgeon, Sir John Campbell, to whom they were indebted for the equipment of the first operating theatre, would be attached to the new operating unit. The hospital was one of the first to be handed over for the care of the wounded during the late war. Sir John Campbell briefly sketched the history of the hospital which was established in a house in Carlisle-street by the late Dr. W. K. M'Mordie in 1872, the present building being erected two years later, and the architect, Mr. Thomas Houston, presented Her Royal Highness with a golden key.

Royal Academy of Medicine in Ireland.

The report of the year 1927–28 was presented at the annual general meeting of the Royal Academy of Medicine on Oct. 11th. The membership and the attendance at meetings had increased from the previous year. The following were elected or re-elected to their several offices: President, Sir William Taylor; General Secretary and Treasurer, Dr. T. P. C. Kirkpatrick; and Secretary for Foreign Correspondence, Mr. L. A. Cassidy. Presidents of the Sections were elected as follows: Medicine, Prof. R. J. Rowlette; Surgery, Mr. R. A. Stoney; Obstetrics, Dr. G. FitzGibbon; Pathology, Mr. T. T. O'Farrell; State Medicine, Dr. J. W. Bigger; and Anatomy and Physiology, Dr. W. Fearon.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED OCT. 6TH, 1928.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 130 (last week, 94); scarlet fever, 2581 (last week, 2329); diphtheria, 1237; enteric fever, 90 (last week, 74); pneumonia, 930; puerperal fever, 47; puerperal pyrexia, 95; cerebro-spinal fever, 9; acute poliomyelitis, 13; acute polio-encephalitis, 2; encephalitis lethargica, 22; dysentery, 9; ophthalmia neonatorum, 98. No case of cholera, plague, or typhus fever was notified during the week. Scarlet fever is specially prevalent in Leeds and other parts of the West Riding of Yorkshire.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Oct. 9th–10th was as follows: Small-pox under treatment, 12; scarlet fever, 2211; diphtheria, 1607; enteric fever, 55; measles, 68; whooping-cough, 263; puerperal fever, 19 (plus 15 babies); encephalitis lethargica, 70; poliomyelitis, 1; "other diseases," 14. At St. Margaret's Hospital there were 19 babies (plus 9 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was 1 death from small-pox, 4 (1) from enteric fever, 11 (2) from measles, 3 (0) from scarlet fever, 36 (14) from whooping-cough, 26 (6) from diphtheria, 146 (32) from diphtheria and enteritis under two years, and 57 (13) from influenza. The figures in parentheses are those for London itself.

The death provisionally classified to small-pox was assigned to the county borough of Gateshead. The fatal cases of enteric fever outside London were reported from Wigan, Halifax, and Hull. Four fatal cases of measles were reported from Liverpool. Manchester reported 4 and Liverpool 3 fatal cases of whooping-cough. The number of deaths from diarrhœa and enteritis is beginning to diminish; Liverpool reported 20, Birmingham 7, Leeds 6, Manchester and Sunderland 5 each.

The number of stillbirths registered during the week in the great towns was 278 (corresponding to a rate of 43 per 1000 births), including 39 in London.

VOLUNTARY AID DETACHMENTS.—A total of 90 men's and 801 women's detachments, comprising a total membership of 22,943, have received recognition by the War Office under the post-war scheme inaugurated in 1923. This is an increase of 40 detachments and 1044 members on the previous half-yearly returns.

Correspondence.

"Audi alteram partem."

THE MEDICAL REGISTER.

To the Editor of THE LANCET.

SIR,—Voting papers in connexion with the election of Direct Representatives to the General Medical Council will be issued to-morrow (Saturday, Oct. 20th) to all practitioners having registered addresses in England and Wales. Any such practitioner who does not receive a voting paper in course of post, whether he wishes to vote in the election or not, should immediately communicate with this office in order to ascertain that his address is correctly entered in the Register.—I am, Sir, yours faithfully,

NORMAN C. KING, Registrar.

General Council of Medical Education and Registration of the United Kingdom, 44, Hallam-street, Portland-place, London, W.1, Oct. 19th, 1928.

VACCINATION REFORM.

To the Editor of THE LANCET.

SIR,—In his humorous address published in your issue of Oct. 13th, Dr. J. Walter Carr made the apparently serious suggestion to abandon vaccination in Great Britain on the ground that this assured method of prophylaxis is no longer justified by the present mild type of small-pox. His contention is based on the highly problematical hypothesis that the mild type, only prevalent in this country during the last seven years, will remain so indefinitely. As Dr. Carr admits the protective value of vaccination, the only question at issue is the likelihood of the severe type reappearing again on any scale, for it has never been completely absent for even a few years, as in 1922 20 deaths in 64 cases occurred in East London, and a 44 per cent. mortality only last year in a small outbreak in North-west London.

Fortunately an authoritative pronouncement on this very point has been made recently by a committee of experts and research workers appointed by the Ministry of Health and the Medical Research Council under the chairmanship of Sir Humphry Rolleston, who concluded: "It is, therefore, uncertain whether the present conditions will become stabilised or whether small-pox will revert to the former type." They go on to point out that American experience proves that on several occasions after prolonged prevalence of the mild type it has suddenly reverted to the fatal form, and they quote the example of Detroit with a case-mortality of only 0·37 per cent. in 4681 cases from 1915 to 1923; yet in 1924 the mortality rose to 10·1 per cent. in 1610 cases, or a 27-fold increase, with 124 deaths from the most virulent hæmorrhagic form. Such a warning is surely a safer guide to practice than Dr. Carr's light-hearted suggestion.

Further, the same committee point out that in 1926 there were eight centres of virulent small-pox in Europe, and others throughout the Mediterranean area of North Africa, all in easy reach of our shores within the incubation period of the disease, to say nothing of India. In fact, the present prevalence of mild small-pox is but a measure of the danger when the severe form once more breaks out, and if Dr. Carr's proposal is taken seriously that danger will soon be increased many fold. It is true that revaccination of contacts has helped to control the disease, and the calamity of 1668 deaths in London alone in 1901–04 has since been averted, but to count on the indefinite continuance of such good fortune in face of increasing neglect of vaccination would be foolish in the extreme. The greatest obstacle to vaccination in this country is the ignorance of our people of what a severe epidemic of small-pox is like, due solely to the very success of the measure. Workers in India do know what it is like, and so did that home of the antivaccinist, Gloucester, in the 1895 epidemic.

I cannot understand how anyone with experience of severe small-pox, or even a knowledge of the 278 unvaccinated child victims who fill a corner of the Gloucester cemetery, can shoulder the grave responsibility of advocating the abandonment of vaccination in this country, with the moral certainty of the repetition sooner or later of the Gloucester tragedy. How many cases of virulent small-pox has Dr. Carr seen that he has so little respect for this terrible, disfiguring, blinding, and death-dealing disease, which is absolutely preventable, as in Germany before the great war, by the most effective prophylactic ever discovered?

I am, Sir, yours faithfully,

LEONARD ROGERS, Lt.-Col., I.M.S. (ret.).

South Hampstead, N.W., Oct. 13th, 1928.

MEASLES IMMUNE SERUM.

To the Editor of THE LANCET.

SIR,—In the papers on measles by Dr. W. Gunn (THE LANCET, Oct. 6th, p. 691), by Dr. D. McClean (THE LANCET, 1928, i., 548), and Dr. E. H. R. Harries (*Journal* of the Royal Sanitary Institute, 1928), reference is made to the lack of protection after the administration of the serum of horses which had been injected with the culture filtrate from Dr. Ruth Tunnicliff's coccus. When these horses were immunised, Dr. Tunnicliff's earlier work seemed to me to indicate that culture filtrate should be used for this purpose. The investigations reported seem clearly to establish that the serum of several horses, injected over long periods with filtrate, contained no demonstrable antibody.

It is only fair to say that I know that Dr. Tunnicliff herself is of opinion that immunisation should be done with whole culture, alive or dead, and not merely the filtrate, and she has kindly sent this suggestion to me. Up to the present it has been impracticable to try this method at these laboratories.

I am, Sir, yours faithfully,

R. A. O'BRIEN.

Wellcome Physiological Research Laboratories, Beckenham, Kent, Oct. 15th, 1928.

MASSAGE AND MEDICINE.

To the Editor of THE LANCET.

SIR,—I have only just seen Lieut.-Colonel J. K. McConnel's admirable article on the Slack Abdominal Wall in THE LANCET of August 18th. I need not trouble you with the reason why, but perhaps you will allow me to utilise the occasion to ask any of your readers who recall your recent kind advocacy[1] of the Chartered Society of Massage and Medical Gymnastics (on the occasion of the new issue of the members' register) to notice also the support that is given to your recommendation of the society by the evidence of knowledge and ability here displayed by one of the members.

You have suggested that, as a matter of fairness, the steady loyalty of the great majority of the society's members to the medical profession might well be reciprocated. I would submit that such reciprocity would be in the interest of the profession and to the advantage of a party not least concerned, the patient. It is generally held, as emphatically in the world of medicine and surgery as elsewhere, that any remedial treatment should be administered by members of an organised and regulated body rather than by individuals responsible only to themselves. It is equally, or nearly, as important that the certificate or diploma by which organised membership is distinguished shall be a genuine guarantee of trained efficiency. I beg for practical recognition of the fact, for which I can vouch from considerable and intimate experience, that the certificate of the Chartered Society is beyond comparison the most reliable guarantee of proficiency in the practice of massage, medical electricity, and medical gymnastic treatment. The society's certificate is recognised by

[1] THE LANCET, 1927, ii., 402.

the Admiralty, the War Office, the British Red Cross Society, and by all hospital and medical schools, and, with a very occasional exception, it is the only certificate recognised by them.

Unfortunately it is by no means the only certificate with which we meet. Of the rest, most are of little and many of no value, some being obtainable after a brief correspondence course. Moreover, the right and wise rules of the society, whereby the members are pledged not to advertise except in medical and nursing papers, and to work only in conjunction with a registered medical practitioner, play into the hands of the free-lance and the holder of some worthless diploma. The result is that, without the coöperation of the medical profession, those who have by training and examination (for the high standard of which I can again personally vouch) earned the right to style themselves chartered masseurs and masseuses, must continue to see much of the work available secured by practitioners, many alien, whose qualifications are inferior, but whose liberty of advertisement and independent practice is unrestricted.

It is hardly to be expected that loyalty of coöperation on one side only will long be maintained. If the medical profession generally will make it a rule to secure the services of chartered masseurs or masseuses when this form of treatment is desired, the continued loyalty of the society's members may be relied upon. If not, that loyalty cannot fail to be undermined, and the eventual result will be a loss to the profession and to the public.

I am, Sir, yours faithfully,

JAMES MENNELL.

Park-crescent, Portland-place, W., Oct. 16th, 1928.

WELFARE WORK AND THE PRACTITIONER.

To the Editor of THE LANCET.

SIR,—I venture to draw your attention to an existent state of affairs which is in my opinion derogatory to the medical profession and at the same time bad for the public generally. I suspect, too, that it may be as well known to many of your readers as to myself; and that proportionate to its prevalence may be the difficulty of dealing with it. I refer to the "management" of expectant mothers and healthy infants by what must now be a regular army of workers—mostly women—working in various fields, and directly or indirectly inspired by superior intelligence. Allow me first to make myself plain by illustration.

1. A woman to whom I had given the greatest possible interest antenatally gave birth to a child which died inexplicably a few hours after birth. Several days later (I was still in attendance) a health visitor called and had a long friendly talk with the mother: at parting her words were, "Well, be sure next time, as soon as you become pregnant come up to our clinic."

2. A well-to-do and cultured woman was delivered by me of a boy; several weeks after, on return from a nursing home, she was visited by a health visitor who was perhaps received a little coldly. Whether or no, the only warmth in the interview was on leave-taking when the visitor with the greatest possible kindness invited my patient to apply to the clinic if in any difficulty "as she knew all about babies."

3. A young woman of good social position found it necessary after a month to send her baby to a hostel for infants and at the same time, of course, to wean it. I wrote down and signed explicit instructions as to feeding the infant, adding that such rules were not to be deviated from unless a doctor so ordered. A few weeks there and it was brought home and placed under the care of a highly trained nurse, in whose care it remained for a week until I was summoned. I was astounded to learn (*a*) that in the hostel my directions had been ignored, and (*b*) that the nurse had ignored the hostel, believing the stools to show signs of indigestion for which she had proceeded to peptonise the milk for two hours (!) adding to it whey containing 2·1 (*sic*) per cent. of cream.

What, Sir, are we to deduce from these instances? I personally cannot but believe, apart from the demonstrable harm likely to result and the chaotic state of affairs shown thereby, that they indicate a singular lack of education in this host of auxiliaries, with whom, therefore, the blame does not lie, and in whom also the remedy is not to be found. Remedy I feel there ought to be, and that it is to be sought in such hospitals, institutions, and public services as are concerned, and whose teaching or otherwise responsible heads ought to be promptly, and if necessary coercively, approached by the medical profession as a whole. Else we shall have confusion worse confounded.

I am, Sir, yours faithfully,

London, Oct. 13th, 1928. A. B.

SECURITY OF TENURE.

To the Editor of THE LANCET.

SIR,—The timely warning issued under the above title in last week's number of THE LANCET invites me to illustrate this warning by a concrete example. Three years ago I was appointed medical officer of a large poor-law infirmary. The advertisement gave no indication that the appointment was other than permanent; there was no clause as to any notice terminating the appointment. I took what I thought to be an adequate and necessary precaution by asking the committee that recommended my appointment to define my security of tenure. The infirmary was old, and vague rumours were abroad that it might be closed down in the near future. I was informed that in the *unlikely* event of the closure of the infirmary I should be offered another appointment or adequately compensated.

Unfortunately this was not secured in writing, but nevertheless was regarded as official from the committee making the appointment. No contract was signed except that of public vaccinator to the infirmary. The infirmary has now closed down. I was given three months' notice terminating my appointment and the guardians expressed a hope that I should be successful in the meantime in securing another appointment. No alternative appointment has been offered to me; no compensation has been paid.

The facts I have stated illustrate the false security of these appointments. Guarantees, though given by a responsible committee, are of no value unless they are *written* in the minutes or in a contract.

I am, Sir, yours faithfully,

Oct. 15th, 1928. DISILLUSIONED.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. J. D. Keir is placed on Retd. List with the rank of Surg. Capt.

Surg. Comdr. G. R. McCowen to *Victory*, for R.N. Barracks, Portsmouth.

Surg. Lt.-Comdrs. N. B. de M. Greenstreet to *Cambrian*; and A. B. Grant to *Concord*.

Surg. Lts. A. W. Forsyth to *Moth*; F. G. V. Scovell to *Colombo*; J. J. Cusack to *Vivid*, for R.N. Barracks, Devonport; S. J. Savage to *Dauntless*; and D. L. Pow to *Rosemary*.

ROYAL ARMY MEDICAL CORPS.

Capt. J. D. Corner, from the secd. list, is restored to the establishment.

TERRITORIAL ARMY.

Lts. A. A. Finnigan and A. M. Robertson to be Capts.
R. Pollok (late temp. Surg. Lt., R.N.) to be Lt.
C. de W. Kitcat to be Lt.

General Hospitals: Capt. W. J. S. Bythell, having attained the age limit, retires and retains his rank, with permission to wear the prescribed uniform.

INDIAN MEDICAL SERVICE.

Capts A. C. Craighead, Gurdas Ram Oberai, Jagdish Chandra, P. H. S. Smith, and H. J. H. Symons to be Majs.

Capt. (provl.) F. H. Whyte is confirmed in his rank.

To be Capt. (on prob.): F. R. W. K. Allen.

To be Lts. (on prob.): F. W. H. Caughey, and to remain seconded: J. S. McMillan, V. E. M. Lee, M. R. Sinclair, G. B. W. Fisher, R. A. Paton, A. V. O'Brien, G. F. Condon, S. T. Davies, E. S. S. Lucas, H. W. Farrell, D. Tennant, and H. S. Smithwick.

Temp. Capt. Mohan Lal Kalra relinquishes his temp. commn.

Aga Mohamed Hadi Shirazi to be Temp. Lt.

DEATHS IN THE SERVICES.

The death took place on Oct. 10th of Surgeon-General Alexander Ferrier Churchill, at his residence at Brentwood, aged 89. A graduate of Trinity College, Dublin, he entered the Army Medical Service in 1862, and served in the Sudan Expedition of 1884–85. He was in charge of the Wady Halfy Hospital, and for his services received the medal with clasp and the bronze star. In 1869 he married Ellen Louise Phayre, by whom he had one son and one daughter. Surgeon-General Churchill retired in 1899.

COLONIAL MEDICAL SERVICES.

Dr. P. H. Ward, M.O., Northern Rhodesia, promoted to P.M.O., and Dr. A. F. Wallace, M.O., Northern Rhodesia, to Sen. M.O. The following appointments have been made by the Secretary of State for the Colonies during the month of September: Mr. J. G. Green, M.O., West African Medical Staff, and Surg. Sub.-Lieut. R. D. Mackenzie, R.N.V.R., M.O., West African Medical Staff (Immunologist), Nigeria.

Obituary.

CHRISTOPHER HUGH LEETE RIXON, M.D. BRUX., M.R.C.S. ENG.

AT the early age of 41, Dr. C. H. L. Rixon died on Oct. 6th after a few days' illness. Since 1926 he had been medical officer at Parkhurst Prison in the Isle of Wight.

Son of the late Mr. Alfred Rixon, he was educated at Harrow from 1900 to 1904, and qualified from St. Thomas's Hospital in 1911. Among the resident appointments he held at the hospital was that of house physician to Sir Farquhar Buzzard, and this gave him an interest in neurology and mental disorder which he steadily maintained. During the war he served in the Royal Army Medical Corps with a captain's commission, being mentioned in despatches and twice wounded. He became officer-in-charge of the neurological section of the Reading War Hospital, and later senior medical officer to the Ministry of Pensions Neurological Hospital at Exeter. Dr. R. Eager, who worked with him at this time, writes of his exceptional enthusiasm for the work, of his fine understanding of psychological problems, and his cheerful helpfulness as a colleague. In 1921, after graduating as M.D. of the University of Brussels with highest distinction, he joined the prison service, and for five years was on the medical staff at Brixton Prison. He took the diploma in Psychological Medicine in 1922, and was the author, with Dr. D. Matthew, of a book on "Anxiety Hysteria," besides several useful papers, in our own columns and elsewhere, on the hysterical perpetuation of symptoms, the intelligence of criminals, and the diagnosis of mental conditions in adolescents. The problem of crime interested him especially, and it was his hope that in the Prison Service he would have an opportunity to throw light on the criminal mentality. Writing of his clinical work Dr. Norwood East says: "The keenness and ability which characterised him as a student distinguished him afterwards, and perhaps he was never so happy at his work as when examining a difficult case of cerebro-spinal disease or one of early mental disorder. His clinical acumen, and conscientious and unselfish devotion to duty made him a valued colleague; his manysided interests and keen sense of humour rendered him a delightful companion; and his sincerity, sympathetic nature, and upright character won him staunch friends."

Dr. Rixon leaves a widow, the elder daughter of Mr. W. L. Partridge, of the Indian Civil Service, with a son and a daughter.

BY the death of Dr. T. M. ALLISON on Oct. 8th Newcastle-on-Tyne has lost an able and much respected practitioner whose public services were considerable. Born at Guisborough in Yorkshire, he was the son of the late Mr. Thomas Allison. After a distinguished career as a student at the College of Medicine at Newcastle he graduated as M.B. in 1891 and as M.D. two years later. He acted for a time as assistant demonstrator of anatomy at the College and as visiting medical officer to the Newcastle Dispensary, and then joined the staff of the Royal Victoria Infirmary and the Newcastle Hospital for Women. Especially interested in tuberculosis and diseases of the chest, he was responsible for founding the Children's Sanatorium at Stannington, of which he became medical superintendent and later visiting physician. He was also at one time president of the Newcastle Clinical Society and the author of a book on "Health in Infancy" besides contributions to medical journals. For three years he held the presidency of the Newcastle Rotarian Club, and he was a keen member of the local Society of Antiquarians, a special interest being the collection of flails. During the war he served in France with the 59th General Hospital which he eventually commanded.

Dr. Allison married the daughter of Mr. E. S. Fletcher, and she survives him with a son and a daughter. Another son was killed about six years ago whilst serving in India.

THE death is announced of WILLIAM CASH REED, M.D. Edin., a pupil of Lord Lister. Seventy-eight years of age, Dr. Reed came of an old Quaker family and was born at Stoke Newington. He graduated in the University of Edinburgh in 1877 and after holding a house appointment at the North-Eastern Hospital for Children at Hackney, spent some time as ship's surgeon in the East. On returning to England he settled in Plymouth, where he was partly instrumental in founding the Homœopathic Hospital and where he remained some 20 years. The later part of his active professional life was spent at Liverpool, and at the Hahnemann Hospital there he held the post of junior gynæcologist, besides having appointments to several other institutions in the city, including the Seafaring Boys' Home, in which he was keenly interested. During the late war he served in a Paris Military Hospital, afterwards taking up his practice in Liverpool for a time. The last five years were spent at Exmouth, where he occupied himself largely with work for the welfare of prisoners in Exeter gaol and with the local branch of the St. John Ambulance Association. Dr. Reed married Miss Maud Higham, who survives him with a son and a daughter. His other daughter died not long ago.

THE CALCUTTA SCHOOL OF TROPICAL MEDICINE.—The annual report for 1927 of this school records under appropriate headings the manifold activities in teaching and investigation of the now great school established by Sir Leonard Rogers. Although under the Government of Bengal, the school in reality serves the whole of India, and students attend it from every province. The chief work of its staff is research in the special diseases of the country, and their published contributions give some indication of the zeal and ability with which it has been carried on. In judging their results, however, it is necessary to remember the influence they have in stimulating and maintaining all over India a new appreciation of the value of Western medicine.

DONATIONS AND BEQUESTS.—Mrs. Elizabeth Ann Magee, Chorlton-on-Medlock, Manchester, left £500 to Ancoats Hospital and Dispensary, and, subject to life annuities, £500 between the Cancer Pavilion and Home, Manchester, and the Royal Manchester Children's Hospital; £500 for the Royal Eye Hospital, Manchester, and £1000 for Ancoats Hospital and Dispensary.—The Hon. Anna Jane Peckover, of Bank House, Wisbech St. Peter, Cambs., left £1000 to the North Cambridgeshire Hospital, Wisbech.—Miss Elizabeth Haldane Wylie, of Victoria-road, Waterloo (Lancs), and late of Kincardine-on-Forth, N.B., who left £90,210, after some personal bequests and legacies left the residue of her property and the bulk of the estate for "such charitable institutions or objects in England or Scotland, and in such proportions as her trustees in their absolute discretion may select and determine."—Alderman George Herbert Strutt, of Bridge Hall, Belper, and Ardinglass, Argyll, left £1000 to the Royal Derby Infirmary, and £500 to Holbrook Convalescent Home.

Medical News.

UNIVERSITY OF CAMBRIDGE.—At a congregation held on Oct. 12th the following degrees were conferred :—

M.D.—H. Gardiner-Hill.

M.B. and B. Chir.—A. W. C. Mellor, T. M. Preece, G. M. Addison, G. H. Barendt, C. G. E. Plumstead, D. H. Belfrage, E. T. James, T. St M. Norris, P. G. Bentlif, L. A. P. Slinger, E. W. Lindeck, and H. Smith.

M.B.—G. G. Holmes.

B. Chir.—Hon. W. S. Maclay and M. R. Sinclair.

At a recent examination the following candidates were successful :—

SECOND EXAMINATION FOR M.B., B.CHIR.

Part III., Pharmacology and General Pathology.—W. I. Bain, W. C. Barber, J. H. Bartlett, W. D. Bell, J. G. Billington, R. W. Billington, S. E. Birdsall, H. W. Boake, O. H. Bostock, A. Bowen-Davies, W. V. Bowman, G. O. A. Briggs, A. H. Bulleid, H. G. H. Butcher, E. C. Campbell, C. M. Carr, A. B. Carter, J. G. Connell, G. T. Cook, F. J. Curtis, C. A. de Candole, W. D. Dick, J. R. Duffield, D. G. Evans, C. L. Ferguson, A. C. Fraser, W. G. Gill, W. E. F. Gough, D. G. Gower, E. R. Greathead, A. H. Gurney, C. S. Hall-Smith, G. W. Hall-Smith, J. B. Harman, D. Hay, B. Holden, J. Hughes, L. P. Jameson Evans, R. A. Jones, C. R. T. Lane, N. Langdon-Down, A. D. Latham, B. Lawn, J. C. Lee, D. L. Lewis, R. S. Lewis, T. E. S. Lloyd, B. F. Longbotham, J. L. Lovibond, F. D. MacCarthy, A. N. McCrea, A. B. MacEwan, D. B. McGavin, J. W. McLaren, S. M. Mankodi, C. E. P. Markby, G. C. Martin, M. H. Masina, J. M. Matthew, W. A. Mayne, T. D. F. Money, A. K. Monro, G. G. Mowat, W. H. Mylechreest, R. V. Payne, R. G. Pulvertaft, F. Radcliffe, J. P. Reidy, M. L. Rosenheim, W. W. Sargant, J. H. Shakespeare, F. W. Shepherd, S. M. Silverstone, P. M. Smyth, G. V. Steward, J. B. Tracey, O. S. Tubbs, T. M. Tyrrell, G. E. Walker, H. Walton, H. C. M. Walton, E. D. Ward, J. G. Warren, H. D. White, G. A. W. Whitfield, J. L. Wild, H. W. Williamson, W. C. Wilson, E. G. Byrde, M. M. M. M. Saleeby, and G. M. Spencer.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, AND THE ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW. The following candidates have passed the triple qualification examination :—

FINAL EXAMINATION.

Leslie Myers, J. T. F. Pearse, Hanna Barsoum, J. R. Martin, C. K. Row, R. N. Calvert, S. B. Brownsberger, G. A. Nelson, M. I. Mullen, Thilliampalam Ra[illegible] P. A. P. Fennell, F. R. B. H. [illegible] Chrysostom Joseph, Kandah [illegible] Neville, Gerald Kahn, D. S. McMillen, J. H. Brush, C. H. Rowe, N. W. Laing, T. R. Jansen, Hugh Craig, Labib Malik-Mansour, E. L. Fraser, A. H. F. Arnott, Hope D. Lazarus, J. B. Cole, Hubert Gunaratna.

Medicine.—Y. A. R. Ezzat, William Stevenson, M. G. Lucas, Robert Cumming, L. H. Abeyewardine.

Surgery.—Anna G. McGregor, Y. A. R. Ezzat, M. A. Yousef, Velupillai Sivapragasam, B. A. D. Robert, Donovan Brink, A. B. O'Brien.

Midwifery.—Anna G. McGregor, Y. A. R. Ezzatt, M. A. Yousef, Ghanashyam Das, F. E. Smyth, L. O. Abeyaratne, Robert Cumming, Velupillai Sivapragasam.

Medical Jurisprudence and Public Health.—D. A. Black, T. A. M. Ashford, H. P. Lawson, J. G. Bryson, Jean G. Clark, M. A. Yousef, I. M. A. Ismail, E. O. Hagedorn, Cyril Bellamy, M. D. Evelyn, D. M. O'Flaherty, M. P. Moss, A. R. Hunt, M. U. Hayat.

The following candidates have also been successful :—

DIPLOMA IN PUBLIC HEALTH.

R. L. Mackay, Richard Norton, James Sharpe, Constance P. Hunter, Andrew Law, A. D. Mack.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At a quarterly meeting of the Council on Oct. 11th, with Sir Berkeley Moynihan, the President, in the chair, the diploma of Fellow was conferred upon Robert Milnes Walker, M.B. Lond., who has previously passed the requisite examinations and has now attained the age of 25 years. Diplomas of Member were also conferred upon the following who have previously passed the necessary examinations and have now complied with the by-laws, viz.: H. T. Flint, Westminster; H. Jeomye, Middlesex; and Margaret C. Rosser, Birmingham.

Mr. Hugh Donald Fleming, lately a student at Epsom College, was nominated as the thirty-sixth Jenks Scholar.

The Bradshaw Lecture—on Axial Rotation, Purposeful and Pathological—will be given at the College at 5 P.M. on Thursday, Nov. 8th, by Mr. C. H. Fagge.

PRINCE OF WALES'S HOSPITAL.—The annual dinner of the Reunion Association will be held at the Trocadero Restaurant, Piccadilly Circus, London, on Thursday, Nov. 8th, at 7.45 for 8 P.M., with Dr. Charles Hadfield in the chair. The secretary of the Association is Dr. J. Browning Alexander, 42, Harley-street, W. 1.

UNIVERSITY OF LONDON MEDICAL GRADUATES' SOCIETY.—The next dinner of this society will be held at the Langham Hotel, London, W., on Wednesday, Oct. 31st, at 7.15 for 7.30 P.M., when the chair will be taken by Sir StClair Thomson. Members may invite medical graduates of the University as their guests. The hon. secretaries' address is 11, Chandos-street, W. 1.

UNIVERSITY COLLEGE HOSPITAL DINNER.—The annual dinner of past and present students was held at the Hotel Cecil on Oct. 12th. Surgeon Vice-Admiral Gaskell, Medical Director-General of the Navy and an old student of the hospital, was in the chair, and there were 230 guests present. The occasion marked the centenary of the medical school and the founding of an old students' club, and the gathering was therefore an extremely enthusiastic one. The Dean (Dr. A. M. H. Gray), in replying to the toast of the medical school, was able to give an impressive list of academic and other honours which had fallen to past and present students of the school during the year, and to announce an increase in the annual entry of new students for the forthcoming year. Dr. Herbert Spencer was elected president of the old students' club, and Dr. Glyn Hughes secretary. To the latter all communications relative to the club may be addressed at the Medical School, University-street, W.C. 1.

JOINT TUBERCULOSIS COUNCIL: DINNER TO CANADIAN SCHOLARSHIP TOUR.—British tuberculosis workers were hosts at a dinner given at Verrey's Restaurant, Regent-street, London, on Oct. 16th, to the members of the Canadian Tuberculosis Association on tour in Europe. The programme, which has included Paris, Nancy, Rome, Milan, Venice, and Leysin, is now nearly complete; after attending the conferences in London of the National Association for the Prevention of Tuberculosis (reported in another column), a final visit is to be paid to Edinburgh before the party sails for Montreal from Greenock next Saturday by the White Star liner *Calgaric*. The tour has been organised by Dr. J. H. Elliott, President, and Dr. R. E. Wodehouse, executive secretary of the Canadian Tuberculosis Association, who are conducting the members, many of whom owe their participation to a generous grant of scholarships for the purpose from the Sun Life Insurance Company of Canada. Sir Henry Gauvain presided at the dinner, which was attended by 47 guests with 104 hosts, many of the latter regretting that no guest could be allotted to them. Sir Henry, in proposing "The Guests," recalled the inspiring examples set by Osler and Trudeau, both of whom made it clear that there is no short way to the cure of tuberculosis. Organisation and team-work, such as may be seen at Detroit and Chicago, were essential to provide the elements of success; and he added a hope that our own insurance officials might follow the enlightened example of the Canadian Insurance Company in supporting antituberculosis effort. Dr. Wodehouse, who replied for the Canadian Association, said that its chief object was to interest the general practitioner in tuberculosis, for, said he, if we have him with us we are bound to win. The European visit would help Canada to make its own practice a little more uniform. Dr. Stuart Pritchard, of Michigan, responded for a number of American tuberculosis workers who accompany the party. Before the response Sir Henry called upon a number of representative tuberculosis workers in this country to support the toast, and a few well-considered remarks were made by Sir Robert Philip, Sir Oscar Warburg, Dr. G. Lissant Cox, Dr. C. O. Hawthorne, Dr. Marcus Paterson, Dr. T. N. Kelynack, Prof. S. Lyle Cummins, and Dr. Jane Walker. Dr. W. J. Dobbie, of Weston, Ontario, proposed "The Hosts," to which Sir George Newman and Dr. Ernest Ward, hon. secretary of the Joint Council, responded. Sir George looked forward to a time when the efforts of the Canadian Association would result in the building of an Empire free from the scourge of tuberculosis. Dr. Ward's witty reply defies summary. "The Sun Life Insurance Company of Canada" was proposed by Dr. Elliott, who spoke of periodic health examinations, and pictured what this principle might mean if universally applied in a young nation like Canada. Mr. T. B. Macaulay, President of the Company, in reply, feigned surprise at the meed of gratitude offered to him for the scholarships. A coöperation such as an insurance company was not, he said, free from the duties of good citizenship, and as his company happened to be prosperous it was supporting all worthy causes. £10,000 had been granted to try out the Calmette preventive treatment, and no single policy-holder had ever raised any objection to such grants. Sir StClair Thomson proposed "The Chairman," and the company rose at a late hour to sing Auld Lang Syne.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, Oct. 22nd.—8 P.M., ODONTOLOGY. Mr. G. Northcroft: The Desirability for the Establishment of a Rationalised Standard for the Prevention of Dental Disease in Children (Presidential Address). Casual Communication: Dr. Inrie: The Radiographic Appearance of Certain Specimens of Periodontal Disease in the Museum of the Royal College of Surgeons.

TUESDAY.—5 P.M., MEDICINE. A discussion on Hypochondria will be opened by Dr. R. D. Gillespie. Other speakers will be: Dr. C. P. Symonds, Dr. W. R. Reynell, Dr. T. A. Ross, Dr. R. S. Allison, Dr. Robert Hutchison.

WEDNESDAY.—5 P.M., COMPARATIVE MEDICINE. Sir John Moore: The Old and the New of Veterinary Science and Practice (Presidential Address).

THURSDAY.—8.30 P.M., UROLOGY. Mr. J. Swift Joly: The Cystoscope (Presidential Address).

FRIDAY.—5 P.M., CHILDREN. (Cases at 4.30 P.M.) Short Paper: Prof. Taillens (Lausanne): Dyspepsia in Childhood. 8 P.M., EPIDEMIOLOGY. Dr. F. E. Fremantle: The Authority of Parliament in Relation to Epidemic Disease (Presidential Address).

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

MONDAY, Oct. 22nd.—8.30 P.M., Discussion on the Diagnosis and Treatment of Empyema, to be introduced by Dr. C. E. Lakin and Mr. A. Tudor Edwards.

HARVEIAN SOCIETY OF LONDON.

THURSDAY, Oct. 25th.—4.30 P.M. (at the Paddington Green Hospital), Clinical Meeting.

LONDON CLINICAL SOCIETY.

THURSDAY, Oct. 25th.—8.30 P.M. (at London Temperance Hospital), Annual General Meeting and Clinical Evening. All practitioners invited.

MEDICO-LEGAL SOCIETY.

THURSDAY, Oct. 25th.—8.30 P.M. (at 11, Chandos-street, Cavendish-square, W.), Dr. Godfrey Carter: Status Lymphaticus or Lymphatism, followed by a discussion.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.

WEDNESDAY, Oct. 24th.—4.15 P.M. (at St. John's Hospital, 49, Leicester-square, W.C.), Clinical Cases.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.

MONDAY, Oct. 22nd.—5 P.M., Mr. T. W. P. Lawrence: Demonstrations of Surgical Specimens.

FRIDAY.—5 P.M., Sir Arthur Keith: The Development of the Human Foot and its Bearing on Club-foot (Illustrated by specimens.)

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Oct. 22nd, to SATURDAY, Oct. 27th.—FELLOWSHIP OF MEDICINE, Medical Society of London, 11, Chandos-street, Cavendish-square, W. Mon. at 5 P.M.: Lecture by Mr. E. G. Slesinger: Fractures at the Wrist. Free to members of the medical profession. —CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C. Intensive course.—HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C. [illegible] LONDON SCHOOL OF [illegible] W.C. Tues. and [illegible] YAL NORTHERN [illegible] S. at 4 P.M.: X Ray Demonstration by Dr. C. Gouldesbrough. No fee.—CANCER HOSPITAL, Fulham-road, S.W. Fri. at 2.30 P.M.: Demonstration by Mr. P. P. Cole. No fee.—WELLCOME MUSEUM OF MEDICAL SCIENCE, 33, Gordon-street, W.C. Wed. at 4 P.M.: Dr. Donald Hunter: Portals of Entry in Tuberculosis: Morbid Anatomy and Some Clinical Aspects. Free to members of the medical profession. Further particulars from the Secretary.

UNIVERSITY COLLEGE, Gower-street, W.C.

MONDAY, Oct. 22nd.—5 P.M., Prof. E. B. Verney: Urinary Secretion. (Second lecture.)

FRIDAY.—5 P.M., Prof. J. C. Drummond: Recent Work on Vitamins. (Third lecture.)

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.

WEDNESDAY, Oct. 24th.—4 P.M., Dr. W. J. O'Donovan: Occupational Cancer of the Skin.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY, Oct. 25th.—4 P.M., Mr. Doyne Interstitial Keratitis.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

TUESDAY, Oct. 23rd.—3.15 P.M., Mr. E. Wolff: The Oculo-motor Nerve.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, Oct. 22nd.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Simmonds: Surgical Out-patients. 4.30 P.M., Dr. Archer (demonstration): Analysis of Blood and Urine.

TUESDAY.—11 A.M., Mr. Endean: Venereal Diseases (demonstration). 2 P.M., Dr. Shaw: Medical Out-patients.

WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. 2 P.M., Mr. Tyrrell Gray: Operations. 2.30 P.M., Mr. Donald Armour: Surgical Wards.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 2 P.M., Dr. Ironside: Medical Out-patients. 2 P.M., Mr. Bishop Harman: Eye Department.

FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department. 4.30 P.M., Dr. Archer: Analysis of Blood and Urine.

SATURDAY.—9 A.M., Mr. Vlasto: Operation on Throat, Nose and Ear. 9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Diseases of Children.

Daily, 10 A.M. to 5 P.M., Saturdays 10 A.M. to 12 noon. Medical and Surgical In-patients and Out-patients. Operations, Special Departments, Anæsthetic Course.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Oct. 22nd.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

ST. PAUL'S HOSPITAL POST-GRADUATE COURSE, Endell-street, W.C.

WEDNESDAY, Oct. 24th.—4.30 P.M., Mr. R. H. Jocelyn Swan: Tuberculosis of the Urinary Organs.

ANCOATS HOSPITAL POST-GRADUATE LECTURES, Mill-street, Manchester.

THURSDAY, Oct. 25th.—3.45 P.M., Mr. Diggle: Common Ailments of the Ear, Nose and Throat.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, Oct. 23rd.—4.15 P.M., Sir Berkeley Moynihan: Some Problems in Gastric Surgery. (Lloyd Roberts Lecture.)

FRIDAY.—4.15 P.M., Prof. J. S. B. Stopford: Prognosis after Nerve Suture.

Appointments.

ANDERSON, C. A., L.R.C.P. Lond., M.R.C.S., has been appointed Certifying Surgeon under the Factory and Workshop Acts for Sandwich.

BANKS, CYRIL, M.B., B.S. Lond., D.P.H., Medical Officer of Health for Nottingham.

CLARKE, T. H., M.B., M.R.C.S., D.L.O., Honorary Surgeon to the Ear, Nose and Throat Department of the Kent and Canterbury Hospital.

CRITCHLEY, M., M.D. Bristol, M.R.C.P. Lond., Assistant Physician, National Hospital, Queen-square, W.C.

MACDONALD, E. K., M.D., B.S. Lond., Medical Officer of Health and School Medical Officer for Keighley.

Vacancies.

For further information refer to the advertisement columns.

Aylesford, Kent, British Legion Village, Preston Hall.—Res. H.P. £100.

Barnsley County Borough.—Asst. M.O., &c. £600.

Birkenhead General Hospital.—Sen. H.S. £150.

Birmingham General Hospital.—Res. Surg. O. £180.

Birmingham, Queen's Hospital.—Res. Surg. O. £100.

Bradford Royal Infirmary.—H.S. and H.P. Each £150.
Brighton, Sussex Maternity and Women's Hospital.—Res. H.S. £130.
Bristol, Royal Hospital for Sick Children and Women, St. Michael's Hill.—H.S. and H.P. Each £125.
Cancer Hospital, Fulham-road, S.W.—H.S. At rate of £100.
Cardiff, Glan Ely Tuberculosis Hospital, Fairwater.—Asst. Res. M.O. £200.
Charing Cross Hospital, W.C.—Res. M.O. £350.
Chester Royal Infirmary.—Honorary Surgeon.
Chesterfield Borough.—M.O.H. £900.
Chesterfield and North Derbyshire Royal Hospital.—Res. Surg. O. £300.
Dunedin, New Zealand, Otago University.—Professor of Pathology. £1000.
East Ham County Borough.—Asst. M.O. £600.
Elizabeth Garrett Anderson Hospital, Euston-road.—Ophthalmic S. Also Asst. S. to Throat, Nose and Ear Dept.
Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Res. H.P. At rate of £100.
Hudd. [illegible], *&c.*—Res. M.O. £500.
Hull [illegible] rate of £130.
Ilford [illegible] H.S. £90.
Lahor [illegible] .—Prof. of Physiology, I.
Leicester Royal Infirmary.—2nd Res. Anæsthetist. At rate of £250.
London Homœopathic Hospital, Great Ormond-street, W.C.—Three Res. M.O.'s. Each at rate of £100.
Maudsley Hospital, Denmark Hill, S.E.—Asst. M.O. £300.
National Hospital, Queen-square, W.C.—Registrar. £200.
Oswestry, Shropshire Orthopædic Hospital and Agnes Hunt Surgical Home.—H.S. £200.
Royal Eye Hospital, St. George's-circus, Southwark, S.E.—Res. H.S. and Asst. H.S.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—H.S. At rate of £100.
St. Thomas's Hospital, S.E.—Asst. Pathologist. £450.
Salisbury General Infirmary.—Res. M.O. £150.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—Res. £100.
Shanghai Municipal Council.—P.H. Dept. Asst. Radiologist. 700 Taels a month.
Sheffield University.—Asst. Bacteriologist. £300.
Winchester, Royal Hampshire County Hospital.—Sen. Res. M.O. £200.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Loughor (Glamorganshire).

Births, Marriages, and Deaths.

BIRTHS.

BUTTERY.—On Oct. 11th, at Grimston-avenue, Folkestone, the wife of J. W. D. Buttery, F.R.C.S. Edin., of a son.
IMRIE.—On Oct. 9th, at a nursing home, Sheffield, the wife of Dr. C. Gray Imrie, Fulwood-road, Sheffield, of a daughter.
MATHEWS.—On Oct. 8th, at Kirkby Lonsdale, the wife of Richard G. Mathews, M.B., B.Ch., of a daughter.

MARRIAGES.

WHITLOCK—WELLS.—On Oct. 6th, at St. George's, Hanover-square, Denis Banes Whitlock, F.R.C.S. Edin., of Bromley, Kent, to Sylvia Mary Wells, daughter of Mr. and Mrs. Leonard Wells, C.C., of Shortlands.
WIGGLESWORTH—SEMPLE.—On Oct. 3rd, at St. Saviour's Church, St. Albans, Dr. V. Brian Wigglesworth, M.A., B.Ch., to Mabel Kathleen, second daughter of Lieut.-Colonel Sir David and Lady Semple, Claremont, Battlefield-road, St. Albans.

DEATHS.

ALLISON.—On Oct. 8th, after a short illness, Thomas Moffatt Allison, M.D., of Eldon-place, Newcastle-on-Tyne.
CHURCHILL.—On Oct. 10th, at Tirley, Priests-lane, Brentwood, Essex, Surgeon-General A. F. Churchill, late Army Medical Staff, in his 90th year.
MACKAY.—On Oct. 11th, at The Cloisters, Knaresborough, Dr. Ian Donald Mackay, aged 66 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

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Notes, Comments, and Abstracts.

A SUMMARY OF RECENT WORK ON VIGANTOL (IRRADIATED ERGOSTEROL).

BY DR. W. PFANNENSTIEL,
PRIVAT-DOCENT IN THE UNIVERSITY OF MUNSTER (WESTF.).

RESEARCHES by the English and American workers, A. F. Hess, Weinstock and Helman, Steenbock and Black, Rosenheim and Webster, and others, have shown that lipoid-containing foods (such as oils, milk, flours, or meat) can take on antirachitic properties as the result of exposure to the energy of short-wave rays of 275–300 $\mu\mu$. To all appearance, therefore, the process of irradiation is able to transform an inactive lipoid substance—a "pro-vitamin" (Windaus)—contained in these foodstuffs into active vitamin D.

Vitamin and Pro-vitamin.

This important discovery led to endeavours to define the pro-vitamin chemically. It is deserving of special mention that to this end an international coöperation of English, American, and German investigators was instituted, which has proved extraordinarily fruitful. As a result of the joint labours of O. Rosenheim (London), A. F. Hess (New York), and A. Windaus (Göttingen), the antirachitic active principle was discovered and a pro-vitamin prepared chemically pure for the first time. The vitamin has never been got chemically pure; according to Rosenheim only 10 per cent. of it is present at any given time.

The pro-vitamin proved to be an unsaponifiable substance belonging to the sterol fraction. This occurs in all animal organisms, and can be converted, by irradiation of the living animal with ultra-violet light, into active vitamin D, such as is already normally present, in particular, in cod-liver oil. Thus it became possible to trace the therapeutic effect on rickets of cod-liver oil (E. Mellanby) and of irradiation with natural or artificial sunshine (K. Huldschinsky) to the influence of the same chemical force. In the first case the ready-made active vitamin is administered by the mouth and comes immediately into action; in the *second* case the active vitamin D is synthesised, by means of the irradiation, out of the pro-vitamin present in the organism. The chief physiological action of the vitamin apparently consists in a counterbalancing of the *ion-equilibrium* between Ca^{II} and PO_4^{III} which is necessary for regular bone-formation (Freudenberg and György).

When it had been determined that the pro-vitamin is a sterol, further efforts were made to isolate vegetable and animal sterols capable of being changed by ultra-violet irradiation into active antirachitic agents. Up till a short time ago—largely by reason of the experiments of A. F. Hess, who had succeeded in activating cholesterol by irradiation—it was in the latter substance that the precursor of the active principle had been sought. O. Rosenheim and, independently, Pohl were able to produce evidence, however, that cholesterol itself is not to be regarded as the pro-vitamin. The deciding factor in this *assumption*—apart from the fact that every cholesterol could not be activated in the same way—was the demonstration by spectro-metric methods of the presence, in admixture with cholesterol, of a substance with *quite characteristic* absorption bands. According to investigations by A. Windaus, this substance is identical with ergosterol ($C_{27}H_{42}O$, showing three double bonds).

The ergosterol which occurs as an impurity in cholesterol, in the proportion of 1:20,000–1:50,000, loses its characteristic absorption and likewise its precipitability by digitonin (Windaus), as the result of ultra-violet irradiation, and acquires antirachitic properties. Cholesterol freed from ergosterol, it was found, could no longer be activated by irradiation.

It has not yet been made clear what are the chemical or physico-chemical changes resulting from irradiation which enable ergosterol to change into vitamin D. Presumably the process which takes place under the action of the rays depends on a steric transposition or a displacement of the double bonds. Oxidative processes probably do not come into the question, as on the one hand experiments by Hess, Rosenheim, and György have shown that oxygen is able to destroy the antirachitic properties of irradiated ergosterol, and, on the other hand, activation can be successfully produced even when oxygen is excluded.

The discovery of Windaus that the pro-vitamin is to be found in ergosterol made it possible to prepare the antirachitic active principle in a pure condition. For ergosterol can be comparatively easily obtained from the sterol of fungi—e.g., ergot—and more particularly from yeast. In the lower plants, as in the algæ of the marine plankton, ergosterol activated by the sun's rays is probably already present. From the plankton the cod probably gets, with its food, the active principle found in cod-liver oil. According to researches by A. Adam, the antirachitic vitamin can be obtained from cod-liver oil by fractional extraction with acid alcohol. These acid extracts show extensive agreement with the spectrum of irradiated ergosterol, which is maintained also after precipitation with digitonin. In all probability, therefore, the active principle in cod-liver oil is identical with that of irradiated ergosterol. Further, the spectrum of insulin also shows an extensive degree of resemblance to that of irradiated ergosterol. Insulin, according to E. Vogt, who has recently directed attention to the relationship between hormones and vitamins, also has its activity increased by irradiation.

Through suitably dosed ultra-violet irradiation any pure ergosterol acquires excellent antirachitic properties. According to Pohl, the light from a magnesium arc is extremely good for the optical transformation of ergosterol, on account of the particularly good spectral dispersion of its energy.

In Germany the E. Merck Chemical Works, Darmstadt, and the I. G. Farbenindustrie-Aktiengesellschaft, Leverkusen, have undertaken the preparation, on a manufacturing scale, of activated ergosterol. The product prepared by these firms under constant biological control as to its efficacy in animal tests bears the name of vigantol.

Animal Experience.

In rats in which rickets has been artificially produced by means of vitamin-free diet, daily administration of a very small dose (1/1000–1/10,000 mg.) of irradiated ergosterol is able to bring the disease-process to a standstill within eight days—as has been shown by the experiments of Rosenheim and Webster, Windaus and Hess, F. Holtz, H. Vollmer (who also employed parenteral administration), and others. By means of further doses, complete healing could be obtained. In puppies with artificially induced rickets, Hottinger was able to produce exactly the same curative effects by the administration of irradiated ergosterol. In all cases the process of healing could be plainly followed by rontgenography and blood-chemical tests.

The effects of deficiency of vitamin D on the full-grown animal organism have been investigated by W. Eichholz and H. Kreitmair. Their results showed an obvious lowering of resistance to infectious diseases in rats and mice which had received a diet free from vitamin D for a period of three to five weeks. When mice fed in this way were infected with pneumococci, 80–100 per cent. of the animals succumbed to the infection, while of normally fed control animals similarly infected only about 60 per cent. died. The same reduction in the rate of mortality could also be obtained, however, when the animals fed on the vitamin-D-free diet received daily 1/1000 mg. of vigantol or some brewers' yeast. When vigantol and yeast were administered together the mortality-rate fell still further to about 37 per cent. By the simultaneous administration of vitamins D and B, therefore, the resistance to pneumococcal infection of mice fed on a rickets-producing diet is actually increased to above the normal.

The latter observation is in full accord with experiments which I carried out in healthy full-grown rabbits. When these received, for a period of six weeks, an addition of cod-liver oil to their normal diet, and afterwards an addition of yeast, their serum at the end of the feeding period showed a pronounced increase in its power to kill typhoid bacilli, an increase which was of notably long duration. From the addition of yeast, cod-liver oil, or lemon juice alone to the diet, on the other hand, no noteworthy increase in bactericidal power could be observed in the serum. It appears, therefore, that the various vitamins are able reciprocally to reinforce each other's action. While the vitamins A, D, B, and C contained in foodstuffs exercised, by themselves, no definite influence, an increase in the bactericidal capacity of the serum was successfully obtained, in young healthy rabbits, by the daily administration of very small doses of vigantol. Over-dosage, or prolonged administration of vigantol, in the rabbit led, however, to loss of weight and in some cases to death with symptoms of very severe cachexia. The latter observations show that in non-rachitic animals the administration of excessive doses of irradiated ergosterol may result in injurious effects, which are, perhaps, to be interpreted as a hypervitaminosis. H. Kreitmair and Th. Moll also found that in animals of various types fatal poisoning could be produced experimentally through excessive doses of vigantol. The authors therefore warn against the indiscriminate administration of large doses.

Human Experience.

In the human subject irradiated ergosterol was first used with success in Germany by György. He found, as did also Beumer and Falkenheim, that the daily administration, over a period of four weeks, of 2–4 mg. was effective, and resulted in the complete removal, demonstrable by blood-chemical and rontgenological examination, of the rachitic changes. Further tests gave similar results, and showed that the commercially prepared irradiated ergosterol, vigantol—both in fluid form (dissolved in olive oil) and in the form of ovoids and pellets—also almost always brings about healing of rickets in children within a short time (Pfaundler, G. Prinke, Seckel, F. Sachs, H. Völckers and Blum, C. Falkenheim, W. Lasch and A. Behrens, A. Hottinger, H. Vollmer, W. Beck, W. Knoepfelmacher, H. Strote, H. Schlossmann, J. Aengenendt, &c.). It was found that by means of doses of 2–4 mg. of vigantol a therapeutic effect could be obtained at least equally as good as that from mountain sun irradiation or the administration of cod-liver oil. The tetany which is frequently associated with rickets generally disappears in no more than from eight to ten days, the blood phosphorus rises to normal within 14 days, the activity and liveliness of the children increases, the sweats disappear, the appetite visibly improves, the anæmia slowly retrogresses, and at the end of 35–56 days recovery is complete.

H. Vollmer found that long before the blood-phosphate had risen to normal, deposits of lime in the epiphyses were already rontgenologically demonstrable. By the daily administration of higher doses (5–10 mg.), according to Vollmer, the process of healing could be still further accelerated. In such cases the unusually high phosphate values after the conclusion of the treatment were striking. On the other hand, no definite healing was obtained by short courses (5–6 days) of still higher doses (about 20 mg. daily). Only continued treatment with small doses led to the desired result.

In connexion with these observations, the investigations carried out by C. Kroetz in four healthy male adults are of interest. To these men, after some weeks on hospital diet, a definite and uniform standard diet was given for two to three days before the experiment, and then 18–30 mg. of vigantol were given daily for seven to eight days. No change in the general condition or in the body-weight resulted. The acid-base equilibrium also did not appear noticeably affected. On the other hand, the mineral balance in the excretions underwent pronounced changes as a result of the administration of vigantol. The renal excretion of P was slightly, and of Cl and H_2O markedly increased, the serum-phosphate level sank, and recognisable blood-acidosis set in. The metabolic change thus obtained by liberal administration of ergosterol in the healthy adult proved, therefore, to be the opposite of that which is produced by small doses in the rachitic child. This observation is the more worthy of notice because it contains in itself the possibility that large doses, as compared with small doses, may produce opposite effects in man, just as in the rabbit. Possibly, however, the reaction of the rachitic human organism to vigantol is different, in principle, from that of the healthy organism.

This requires particularly to be taken into consideration in the prophylactic use of vigantol. When the beginnings of rickets are already present, however, treatment with irradiated ergosterol has proved eminently effective. The rickets which experience shows to occur, almost without exception, in prematurely born infants and in twins, even in the summer months, could be prevented, according to the investigations of Vollmer and of Lasch and Behrens, by daily doses of 1–3 mg. of vigantol.

The effect which irradiated ergosterol exercises on the organism as a whole is in all probability bound up with an improvement in the condition of immunity. This appears on the one hand from the above-mentioned experiments on animals, and on the other from observations by C. Falkenheim, W. Beck, and others, who saw striking improvement produced also in the broncho-pneumonia with which rickets is frequently complicated.

P. György, W. Starlinger, M. Sternberg, and A. Hottinger all report further that they have also obtained curative results in cases of severe osteomalacia from the daily administration of 3–10 mg. of vigantol. These results were obtained, however, only after months of treatment, considerably later, therefore, than in the rickets of children.

Apart from rickets and osteomalacia, there appears to be every likelihood that other affections can also be beneficially influenced by the administration of irradiated ergosterol. Investigations made by R. Seyderhelm and H. Tammann in dogs with biliary fistulæ make it extremely probable that not only the lime and phosphate metabolism but also the production and disintegration of erythrocytes are regulated by the direct or indirect action of substances of

the structure of irradiated ergosterol. Like the bile-acids, activated ergosterol was found to be able to improve or cure the anæmia of biliary fistula in dogs. On the basis of these experiments, G. Rosenow has already sought to influence pernicious anæmia in man with combined liver diet and vigantol treatment, and in some cases has obtained noteworthy results. Stern reports a case of tetania parathyreopriva, and Birkholz two cases of ozæna, which were favourably influenced following the use of vigantol. According to observations of E. Bors and I. G. Knopflach the formation of callus in fractures of the bone was hastened by the action of vigantol.

Conclusion.

It may be said that the discovery that irradiated ergosterol can function as vitamin D—better, "vitasterin" D (Kroetz), since it contains no amine—or is identical with it must be esteemed one of the most important results of research in our time. Particularly gratifying is the fact that, for the first time since the world war, English, American, and German investigators have, by joint work, shared in this discovery. Irradiated ergosterol (vigantol) has proved its value as a "curative and protective antirachitic agent" (Pfaundler, Rietschel). To-day nothing stands in the way of its widespread use.

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TRANSFER OF PANEL PATIENTS.

A CORRESPONDENT writes: "I joined the panel when the Insurance Act first came into force, and the county-town panel in 1918. If I now sell my practice, I understand that my panel patients are notified by the Insurance Committee that they will be transferred to my successor unless they object. Is this correct? Further, I am told that all panel patients are put on an unallocated list and the purchaser only gets those who sign for him. Is this correct?"

The answer to both questions, if we understand them correctly, is in the affirmative. The change in the regulation for the transfer of panel practices dates from 1920. Before that time the panel was transferred to the purchaser with the exception of those insured persons who notified the Insurance Committee of their wish to exercise their right of free choice. Now, every insured person is offered the choice of a fresh doctor, and only those who choose the purchaser are put on his list. Others may be allotted at a later date if they have not chosen. The notices issued to insured persons on the seller's list take this form: (1) There is a paragraph setting out the regulation under which everyone is removed from the list and given the right of free choice; (2) they are all informed that Dr. A. has sold his practice to Dr. B., who is willing to accept any of them on his list. We may cite, as an illustration of what happens under present arrangements, a death vacancy in which there were 2400 on the panel list. Three weeks after the notices had been sent out, 1200 had signed cards to go on the purchaser's panel. Only a small percentage had given notice of fresh choice and transferred to a neighbouring doctor's list. It seems that these notices are not understood by all; some interpret it as meaning that they must make a fresh choice, and many wait until they require treatment before taking any action. The residue, who have given no indication of a desire to change, are allocated, after a period varying in the different areas, to the list of the nearest practitioner, which in the majority of cases would be that of the purchaser.

THE SPECIAL TRAINING OF THE MENTAL NURSE.

Now that attendance at lectures is practically compulsory for all mental nurses, and their promotion depends largely on examination results, text-books are needed to supplement the standard handbook for mental nurses published by the Royal Medico-Psychological Association. It is unfortunate that the educational equipment of many probationers is insufficient to grasp much that is given in the handbook. Probably the only solution is a course of preliminary education, for it is certain that no one can aspire to nurse mental disorders satisfactorily without possessing a wider outlook than that given in our elementary schools. Mental nursing surely requires the highest qualifications of any branch of nursing, and seeing that the men and women who seek employment as nurses in our public mental hospitals are often lamentably deficient in general education, it might even be a wise policy for the state to organise preliminary courses of training before requiring the young nurse to attempt any technical education in her specialty.

A little book[1] published under the auspices of the National Asylum Workers Union and written by a medical officer whose name is not given, claims to be a complete series of lectures for the mental nurse. A cautious foreword by Prof. Shaw Bolton commends the book to the probationary nurse and congratulates the Union on the attempt to cater for the needs of its members, which he considers "deserves the whole-hearted support of every mental nurse." The book is uneven and gives little indication of a broad vision as to the scope of mental nursing. Seventy pages are taken up by general anatomy, physiology, the symptoms of disease, and sick nursing. Then follows 20 pages, one-fifth of the whole book, of description of the nervous system, and lastly, 20 pages are devoted to an account of mental disorders, and to mental nursing proper; five are concerned with psychoanalysis. The description of the nervous system is well done, but it is doubtful whether nurses could possibly understand it without opportunities of seeing dissections and demonstrations from models. The book is inadequate when we come to mental nursing proper. The nursing of dementia præcox is disposed of in a dozen lines and nothing could be more discouraging than the statement that "mentally, much can be done to stave off apathy and stupor by interesting the patient in his surroundings in the early stages, but sooner or later he will pass beyond such means of treatment." This defeatist doctrine does not help nurse or patient. The treatment of mania and melancholia is allotted 15 lines and

[1] Notes for the Mental Nurse in Training. By a Medical Officer of a Mental Hospital. Manchester: Express Co-op. Printing Co. Pp. 113. 1s.

general paralysis 22 lines. There are several serious omissions. For example, the chapter on first aid gives no instruction for the treatment of wounds; the principles of asepsis are not mentioned, nor is the nurse told how to clean a catheter. The book has no index.

The effort to help the mental nurse to understand her work is commendable, but in our view it is a mistake to attempt to cover all this ground in a single volume. The more condensed a subject, the more difficult it is to grasp. Condensation suggests learning by heart, and the storing in the mind of words without understanding. It would be better to prepare several independent little volumes dealing with different aspects of mental nursing and to omit subjects, such as anatomy and first aid, which are adequately dealt with in easily accessible manuals. The section on the anatomy of the nervous system would form the basis of an excellent little volume of this kind, and several other chapters, if expanded, could be used with advantage in such a series.

DIET HELPS FOR DOCTORS.

DESPITE the attention that one understands is given to diet in the United States, things must still be far from satisfactory if some of the statements set out in Diet Helps for Doctors (issued by the Battle Creek Food Company) are to be taken as written. For example: "More than half the people in the United States are suffering from anæmia," "half the population are suffering from lime starvation," "rickets, a disease which does injury to full three-fourths of all children in a large section of the United States." Nor can it be accepted without protest that constipation is "almost universal among civilised people." The first part of this small brochure contains a number of useful tables regarding foods, their caloric values, and the amounts required at various ages and in various occupations. Several diseases are then discussed, a brief review of the pathology being followed by hints on the construction of suitable diets with complete lists of the foodstuffs advised. There is a chapter on feeding in diabetes, with a scheme for building up a diet, and comprehensive lists of the caloric value and carbohydrate content of articles most usually met with at the table. The section on constipation is well written, though it contains a plea for three to four evacuations a day, which seems excessive. Too little emphasis is laid on the value of regular habit in this connexion and rather too much reliance placed on the gastro-colic reflex. In many people the bowels are emptied immediately after rising, before any food is taken; this seems a preferable method and one which depends entirely on habit. We are apt to associate rapidity of movement with our friends in America, and apparently their alimentary canals are also in a permanent hurry, since we are told that "four hours from the time the breakfast is eaten the unused residue has reached the ileo-cæcal valve." Many British stomachs are not empty till between three and a half to four hours after a meal. Perhaps there is some connexion between this gastric sloth and the relative slowness that our lay press deplores in its comments on the sportsmen of two countries; in this book, at any rate, athletes are grouped with savages and healthy children as being among those who "move their bowels three times a day or oftener," being second in this respect only to the large apes.

Apart from these peculiarities the handbook contains much sound common sense and should prove a real help in constructing a diet. It is well printed and has some ingenious illustrations; the diet tables for the various diseases are well planned and easy to understand. The book bears out the claim, made in the foreword, that it is "a brief compilation . . . which any progressive physician will be glad to have at hand for ready reference."

GYNÆCOLOGY AND OBSTETRICS IN LIVERPOOL UNIVERSITY.

THE attention of clinical gynæcologists and obstetricians is drawn to a monograph by Prof. W. Blair Bell on the Material and Methods of the Gynæcological and Obstetrical Department in the University of Liverpool.[1] This recently appeared in four parts in the *Journal of Obstetrics and Gynæcology of the British Empire*. It presents an intimate account, illustrated with many photographs and plans, of an organisation and a technique that have been built up by experts to fulfil a definite practical purpose. Prof. Blair Bell here describes his personal ideas and their fruition in the hope of stimulating others to that healthy rivalry from which progress springs.

The practical utility of the department is proved by the demands made upon it, for, in spite of its unusual size, its accommodation is taxed to the utmost. It contains museums, laboratories, research rooms, an animal house, a lecture theatre, photographic rooms, the professor's room and a secretary's room, and is separated from the wards in the Royal Infirmary only by a passage 95 yards long. The pathological specimens in the teaching museum are arranged according to the classification of the patients' case-cards in the hospital; the descriptive placards aim at correlating the symptoms and history of the case with the specimen itself. The cataloguing and labelling scheme is very highly organised, and close attention is paid to detail. The walls are hung with framed photographs and coloured pathological diagrams, and there is a fine set of radiograms of abnormal conditions of pregnancy. Many obstetrical specimens are mounted in plaster-of-Paris under liquid paraffin in large flat-bottomed porcelain receptacles resembling plunge-baths, with plate-glass covers. This method makes it easy to see and photograph the specimens.

The routine work of simple pathology, bacteriology, and biochemistry is done in the director's laboratory, but more advanced work goes to the professors of biochemistry or pathology. The necessary work of photographing and drawing specimens is efficiently provided for. The teaching arrangements are in a transitional stage owing to the introduction of the new curriculum, but Prof. Blair Bell has already shifted a large amount of the gynæcological and obstetrical instruction to the fifth year to allow students to complete their ordinary surgical dressing and medical clerking before approaching his subject in earnest. The systematic lectures begin with the summer of the fourth term (two a week), are continued through the autumn and Lent terms (three a week), and close with the summer term of the fifth year (two a week). There are about 70 in all. The complete outfit for delivering this course, with 1147 slides, 62 subject-heading cards, and 205 illustrative cards, can be obtained from the publishers of the *Journal* for £95.

Individual research is regarded as an obligation on each member of the staff, and workers have at their disposal valuable instruments and skilled assistants, with the personnel as their mouthpiece. Collective research, for problems which require team-work, is organised with the coöperation of the heads of the various departments, each of whom receives a small honorarium from a special fund, and the help of whole-time workers and laboratory assistants according to the necessities of the work. Interim reports are issued to the whole staff. The professor of obstetrics and gynæcology is director in the first collective research organised by him for the study of malignant disease, and his department is used as a clearing-house. Staff meetings are held periodically. He hopes to make the organisation a permanent University scheme, and to attack other problems, such as the toxæmias of pregnancy, which are likely to be solved only by collective investigation. The brochure also gives a detailed account of the technique in use in the wards and theatre.

CANE SUGAR AS A REMEDY.

To the Editor of THE LANCET.

SIR,—Some years ago[1] Mr. Henry Curtis recommended intramuscular injections of cane sugar in phthisis. Injections are troublesome, so I tried administration by the mouth, and being in China at the time I had to conceal the nature of the drug owing to a local superstition. This led to the addition of ammoniated quinine. On returning to England I found that some brands of sugar on the market did not work, so I consulted a chemist who suggested yellow demerara as the purest form of cane sugar easily obtained. This I found satisfactory, except that at first I had to face a hostility to yellow sugar similar to that which exists against brown flour. But the results obtained speedily convinced the objectors. In influenza colds, heart cases, lung cases, and for delicate children I use the following prescription, slightly varied to meet the special needs of the patient: One or two teaspoonfuls of demerara sugar dissolved in a small glass of hot water, to which is added either half to one teaspoonful of tincture of ammoniated quinine or, in heart cases, the same amount of sal volatile. In the case of children it is taken neat. Those who prefer an effervescent drink may add a pinch of bicarbonate of soda and tartaric acid. The winter is just coming, and those who freely take above need have no fear of colds. I usually prescribe it before meals, but any time will do. On arriving home wet and cold from a round, I take a dose at once.

I am, Sir, yours faithfully,

Oct. 16th, 1928. C. G. S. BARONSFEATHER, M.D.

*** The late Dr. Arthur Goulston was a consistent advocate of the beneficial effects of cane sugar on the myocardium.

[1] Manchester: Sherratt and Hughes. 1928. Pp. 61.

[1] THE LANCET, 1919, i., 636.

An Address
ON
MICROBIC DISSEMINATION IN SCHOOLS.

Delivered before the School Medical Officers Association on Oct. 19th, 1928,

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NAVAL and school medical officers have practically the same duties to perform and have to divide their attention equally between clinical and preventive medicine. That is to say, they have to treat the herd as a whole, as well as the individual members of it. School and ships' officers are in medical charge of semi-isolated communities, the members of which live together in much closer communion than is common in the world outside. For this reason the opportunities for bacterial spread, once an infection has been introduced, are generally greater in semi-isolated communities than outside them. Therefore microbic dissemination is of special interest to the school doctor.

THE HARDSHIPS OF PARASITIC BACTERIA.

The spread of any species of living organism, from one habitat to another one which is suitable for its maintenance, involves two processes. First there is the necessity of finding transport for the dissemination of the organism in space, and secondly the species has to establish itself successfully in the new environment when found.

As compared with free-living organisms, parasites have an extra difficult task in finding new habitats or hosts. Moreover, if the parasite is of a disease-producing species its case is even still harder, for whereas a harmless commensal is generally tolerated by any host of the right species who allows it to live in peace for an indefinite time, the pathogenic microbe, after successfully crossing the gap to a new host, may be unable to colonise the new found home owing to the opposition it arouses. Even when successfully established, life for the malignant bacterium is further complicated, because since a pathogen raises the antagonism of its host, a disease-producing organism has to work against time in order to disperse its species to another host before being destroyed by the first one getting well of his illness. Also, should a microbe kill its host so rapidly as to prevent its own dissemination to fresh victims, it commits race suicide and causes the extinction of that line of the parasitic family. In this way the most virulent races of bacteria soon exterminate themselves. Pathogenicity in the abstract is a sign of maladaptation to the environment; hence if a species of parasitic bacteria exists as a virulent and an avirulent variety, the usual practice of calling the latter a degraded, or degenerate, type of the former is most inconsistent. In every case where this happens the so-called degraded form is, biologically speaking, the really successful variety of the species; if success in parasitic life is defined by the number of hosts infected and the duration of their occupation. Also the moral of calling visitors degraded, just because they do not assault their host, is surely not a good one.

AIR-BORNE INFECTION.

Owing to the difficulties in colonising fresh habitats the methods used by pathogenic organisms to transport themselves across the gap between one host and the next are many and various, and the chief successes of preventive medicine have been the discovery and frustration of the methods of parasitic dissemination. For example, the efficiency of sanitation is due to the fact that clean food and water, combined with a sound conservancy system, have raised a barrier between the human egesta and ingesta which the intestinal pathogens can rarely penetrate.

There is a large group of parasites who spread in droplets of the secretions of the infected host. These droplets, with any bacteria who are using them as a vehicle in which to travel to a new host, are sprayed into the air in the act of talking, coughing, sneezing, and snoring. This method of bacterial dissemination in droplets is by far the most important in civilised communities, not because other vehicles of infection, such as dirty milk or water, are not potentially capable of conveying just as much disease to the herd as droplets, but because there are no practical methods of preventing pathogenic microbes from successfully using these droplets for their transport. Whereas, at the present time, a big typhoid or cholera outbreak in England is only due to the indifference or ignorance of the public, or its medical advisers, to the known facts, we are still almost as helpless as our ancestors were in defending ourselves from a droplet-borne epidemic. For this reason I shall confine my discussion almost entirely to droplet- or air-borne infections.

The only way to avoid droplets entirely is complete isolation from one's fellow men, or the constant wearing of a respirator. Although the use of the latter is a wise precaution for those who have to attend such virulent droplet infections as pneumonic plague, or streptococcal influenza, yet it is scarcely feasible to keep a whole school, or ship's company, constantly in gas masks.

Since there seemed no other way of preventing "air-borne" diseases, our grandfathers hoped to control the spread of these infections by the segregation of all those who were attacked by them. After a trial of many years' duration the general consensus of opinion now is that the isolation of infectious disease has had no effect in diminishing its morbidity as a whole, whatever effect may have been produced on the age-distribution, or severity, of infection. The failure of isolation in checking the prevalence of infectious diseases is mainly due to two facts. First the victims of many diseases are more infectious in the early than late stages of their illness, and thus have usually passed their parasites on to others by the time they are segregated. After all, from a priori biological principles, this is only to be expected; a race of bacteria which spreads by droplets is not likely to have much success in the struggle for existence if its victims are rendered immobile, before their parasites get a chance of dispersal. The second reason for the failure of isolation is that many infectious diseases are accompanied by a multitude of hosts who show no evidence of infection. These are the so-called contact and chronic carriers. Carrier is really a bad name for people who have symptomless infection, because they only differ from cases in degree, and the problem to the microbe of finding a new habitat is fundamentally the same whether the old one is called a case or a carrier. Moreover, the term has led to the confusion of the rôle played by the tolerant host, in the spread of infection, with the part played by such things as flies, dirty linen, or droplets, which are more literally carriers or transporters of disease than a tolerant host. However, since it is obvious the term "carrier" has come to stay, after registering this protest I shall talk about carriers in the usually accepted sense.

"CARRIERS."

The importance of carriers lies in their elusiveness; they are often not suspected, and even if they are the laboratory examinations which may be undertaken for their discovery often yield negative results. Also the carrier retains his full mobility and mixes just as usual with his fellows. Sick animals, including man, creep away to their lairs and to some extent automatically isolate themselves from the rest of the herd. It is still not commonly realised how numerous the carriers of certain bacteria can be in a suitable environment. Without examination the statement

that during a certain year the virulent carrier rate in the London County Council schools was 2 per cent., while at the same time the morbidity-rate for diphtheria was 100, conveys a vague impression that cases of diphtheria were more common than carriers, because the number 2 is seen in relation to the number 100, and although, of course, everyone realises the two forms of expression are different, yet only a few who may be especially interested will take the trouble to make the necessary calculation to determine the real ratio of carrier to case infection that such a statement as the above indicates. A 2 per cent. carrier-rate for a year means that there were on the average two carriers always present in every 100 of the population. These two carriers were not always the same individuals, since the carrier state is usually of short duration. A rather liberal estimation makes the average carrier state to last three weeks; according to this estimate the carriers in the population as a whole changed over 17 times during the year, and therefore a 2 per cent. rate meant that 34 per cent. of the population were infected as carriers during the year. On the other hand, a morbidity-rate of 100 per 10,000 per annum meant only 1 per cent. of the population were infected as cases in the year. Hence the original statement implies that carriers were 34 times as numerous as cases in the L.C.C. schools.

Diphtheria has been used to illustrate the preponderance of symptomless over symptomatic infections because in this complaint many exact data are to hand. There is every indication, where there are sufficient observations on the point, that a high ratio of carriers to cases exists in many other bacterial infections, as, for example, influenza, pneumonia, infantile paralysis, or simple sore-throat. It should now be clear that isolation has failed to control the spread of infectious diseases, mainly because it is impossible to discover and control *all* the infected hosts. The attempted removal of infected hosts has met with small success even in animals, other than man, as is well shown in two very important diseases which are caused by bacteria which are adapted to live in another mammal as well as man. In tuberculosis we are still unable to prevent the cow passing on tubercle bacilli to English babies, while in the streets of Valetta we see that perambulating culture of *Brucella melitensis*, which is also known as a goat, milked on the doorsteps of the houses, and the resulting subculture handed straight to the baby; surely no pathogenic parasite has an easier passage across the gap between host and host. And although probably all Maltese babies are weaned on cultures of *B. melitensis*, the causative parasite of undulant fever, yet many survive. Moreover, symptomatic undulant fever in Maltese infants is very rare. (The infantile mortality-rate for Malta in 1923 was 280, but scarcely any of it is attributed to undulant fever.) Thus, although the parasites easily cross the gap between the goat and the baby, yet they seem to find Maltese infants unsuitable hosts in which to establish themselves since they are rarely able to provoke the characteristic reaction termed undulant fever. The escape of Maltese babies from attacks of Malta fever while feeding on cultures of its causative organism is, to my mind, one of the most astonishing natural adaptations of a human herd to its environment, and since I know no more convincing proof that certain human beings can imbibe huge doses of a definite pathogenic microbe which can infect the ordinarily susceptible person by the mouth more easily than most bacteria, I have used this everyday domestic scene in Malta to cross the gap from the distributor to the receiver of disease germs and to introduce the concept of host resistance to parasitic invasion.

VACCINES.

For centuries it has been known that an attack of certain diseases confers immunity against subsequent infection. This observation led the Chinese to use the nasal installation of matured small-pox crusts and Jenner to employ cow-pox inoculation, in order that by giving the subject a mild attack of the disease he would be rendered immune to small-pox in the future. Later, inoculation with dead microbes, or their products, was devised as a prophylactic against attacks by the same living bacteria. Prophylactic vaccines give rise to changes in the host which are similar to those produced by the disease they are intended to prevent, as witness the Widal reaction, which is produced equally well by a dose of dead typhoid bacilli or an attack of typhoid fever. That the inoculation of dead microbes really does raise the resistance to attack by the same species of living bacteria has been clearly proved by animal experiments; but the degree and duration of immunity produced varies over a wide range according to the races, or species, of the bacteria which are used to make the vaccine. Although the principle of raising the defence of the herd against bacterial attack and of ignoring the distributor of pathogenic organisms, and their means of dissemination, has met with a dramatic success in a few disorders such as small-pox and diphtheria, yet on the whole vaccine prophylaxis has been disappointing, especially in the group which may be conveniently termed the minor respiratory infections. These complaints, which comprise those clinically indefinite ailments entered under the headings "influenza," "chill," "colds," "febricula," "bronchitis," and "simple sore-throat," seem to confer little immunity against subsequent attack, which may be one cause of the difficulty of finding an efficient prophylactic vaccine against them. Also practically nothing definite is known about their bacteriological and clinical correlations. This is well illustrated by the fact, that in spite of all the labour that has been expended in the study of epidemic influenza, there is no consensus of qualified opinion as to whether the parasitic virus is filtrable or not, whether the disease is caused by more than one distinct race of parasite acting symbiotically, or even if we are dealing with a single clinical entity. If you do not know the parasites which cause a complaint, or even the complaint when you see it, it is hard to produce a successful vaccine against it. A broad survey of the available statistics on the use of anti-catarrh vaccines in ships and schools forces one to the conclusion that in the aggregate there is little definite evidence that vaccines have had much appreciable effect on the incidence of the minor respiratory diseases. It seems, therefore, in the present state of knowledge, that little impression can be made on the incidence of the minor droplet infections by attempts to isolate the distributors of them or increase the immunity of their receivers by means of a vaccine.

THE NATURE OF DROPLET INFECTION.

In order to see if there is a way of escape from this impasse let us consider briefly the mechanism of droplet infection. These droplets are real things. By coughing, or sneezing at, microscope slides, and staining the result, all sizes of droplets can be seen, some visible to the naked eye containing many cells and hundreds of bacteria, some of microscopic dimensions with only a single cell, or one or two microbes, in them, while others are apparently sterile. The mechanism of their distribution in space can be simply imitated by a puff of tobacco smoke. The explosive jet of smoke only proceeds for a foot or two according to its initial velocity, and is then rather suddenly brought up by the resistance of the air. The smoke then gathers into a cloud which disperses in the prevailing air currents. It is easy to prove experimentally, by using plates of culture media and an harmless index organism which forms characteristic red colonies on culture (*B. prodigiosus*), that exactly the same thing happens, with the spray of droplets ejected by sneeze or cough, as happens with the tobacco smoke. Only that the explosive jet of droplets from the sneeze also contains many relatively heavy particles, including actual lumps of phlegm or muco pus. These heavy particles all drop to the ground, within two or three feet, as soon as the propulsion force of the sneeze or other expiratory

effort ceases; but the smaller droplets which only contain a fraction of the total mass of infective material in the original sneeze may remain suspended in the air for half an hour or more according to the atmospheric humidity and temperature, and may be carried to almost any distance according to the force and direction of the prevailing air currents. This mechanism explains why "contact" has usually to be fairly close in order to catch an infectious disease. In many instances only the explosive preliminary jet of heavy droplets will contain enough infective material to cause illness. The fine mist of droplets, though more persistent and widespread, is generally too dilute to do harm.

Minimal Effective Doses.

These remarks imply that dosage of infective material is a factor in contracting a microbic disease. In general a certain minimum number of bacteria are necessary in order to break through the natural defences of any animal. Susceptible and immune are relative terms. Probably there are no completely susceptible individuals, because that would mean one bacterium was adequate to initiate an infectious disease. Conversely many, who may be immune from attack by the ordinary doses of infection they meet, may succumb when they make contact with bigger doses of bacteria than they are accustomed to—as, for example, when boys leave home for school. Thus each individual of a herd has a special degree of resistance, which can deal with quantities of bacteria below a certain minimum number. This hypothetical number is incapable of exact measurement. It varies relatively and actually in every member of the herd and with every race of bacteria. Moreover, it probably changes hourly and yearly in the same individual. Any number of microbes less than the minimal infective dose will be destroyed by the host, and is for him a subinfective dose. The mechanisms by which hosts destroy noxious parasites would take a few weeks to discuss; but special interest in infection by inhaled dust or droplets is the bactericidal power of the nasal mucosa. Recently Arnold Ostrom and Singer[1] have shown that 90 per cent. of the *B. coli* in an experimental dose are destroyed within 15 minutes of their instillation into the human nose. The specific parasites of disease are probably not disposed of so easily, but undoubtedly the nasal filter is a valuable first line of defence against air-borne infection.

The conception of minimal infective doses and subinfective doses indicates that it may sometimes take time to collect sufficient material to initiate an infection. If more than the minimal infective dose is received instantaneously, as may well happen if a boy receives the full blast of a sneeze in his face, infection is contracted at once. On the other hand, if a boy receives a subinfective dose he proceeds to destroy it and no illness results. If, however, he receives a further sub-infective dose, before the first is completely inactivated, successful infection will depend on whether the remains of the first dose, added to the second, exceeds the minimal infective dose. Under such circumstances infection depends on the spacing of subinfective doses. When the intervals are long enough to permit destruction of one dose before the next is received no illness occurs, but when the intervals are too short infective material will accumulate and, should the subject stop long enough in such an environment, he will collect enough bacteria to initiate infection. In the atmosphere of a crowded room the inhalation of infective droplets must often be almost continuous, and their destruction likewise so, and if the latter process does not exceed the former, catching infection will depend on how long a stop is made in the infected atmosphere.

THE "VELOCITY OF INFECTION."

Shortly stated, the time necessary to contract infection is the minimal infective dose divided by the difference between the rate at which infective material is received and destroyed. This differential rate may be called the velocity of infection.[2]

I originally evolved this hypothesis to try to explain the extraordinary fact that the day boys at Greenwich Hospital School remained completely free from diphtheria and scarlet fever during a period in which over 300 infections by these disorders were notified among the residents. The chief difference between the day boys and residents was that the latter spent ten hours at a stretch in their dormitories, while the day boys slept at home. There was much other evidence which also incriminated the dormitories as the principal places where infection spread; thus I arrived at the conclusion that one to one and a half hours' contact in the class-rooms and the closer but shorter contacts in the playground did not give sufficient time for the day boys to collect enough bacteria to cause symptomatic infection. On the other hand, the ten hours in the dormitory was able to give the time required. Moreover, the velocity of infection is probably the chief factor in determining whether a bacterium establishes itself in the host or is destroyed before it can multiply. Also, if establishment is successful, the velocity of infection still determines whether a symptomatic or symptomless infection results—i.e., whether the host becomes a case or a carrier. All these possibilities—symptomatic infection, carrier infection, or destruction without multiplication—mean that bacteria have been absorbed by the tissues. Experimental work on vaccines demonstrates that the absorption of bacteria and their products can cause an increase in immunity to the corresponding disease. Therefore atmospheres, which support droplets containing specific pathogenic bacteria, act as vaccines and augment the resistance to disease of those who breathe them. In this way in schools and ships large numbers of the inhabitants acquire immunity without symptoms of illness by inhaling subinfective doses of bacteria, or even possibly their dead products in the atmospheric dust. This is the natural process of auto-vaccination.

LATENT IMMUNISATION.

In 1922 I showed that when diphtheria was epidemic large numbers of boys who had no history of diphtheria acquired human diphtheria antitoxin in their blood.[2] This observation has since been confirmed by Lereboullet[3] and Friedemann.[4] The mechanism of the process of natural immunisation may or may not involve actual latent infection. If actual carrier infection is essential there are more than enough diphtheria carriers to satisfy the hypothesis. On the other hand, mere destruction of infective material without actual production of the carrier state may suffice, as is indicated by the work of Monckton Copeman[5] and others who have successfully immunised children by application of diphtherial products to the mucosa of the nose or throat, and of Pockels[6] who claims to have produced immunity by giving children suspensions of dead diphtheria bacilli to drink.

A careful study of the epidemiological data of many other infections more and more confirms me in the opinion that this process of latent immunisation is of widespread general occurrence. I used to instance measles as one of the few exceptions to the general rule; that immunity could be acquired without any definite illness. The attack-rate of measles epidemics on a completely virgin soil approaches 100 per cent., as was seen in the epidemic in Fiji of 1875. This is strong evidence that not much auto-vaccination can take place on such occasions. However, in 1913 Butler[7] pointed out that, in Marlborough College, a past history of measles was not sufficient to account for the escape of all the survivors of the epidemic and gave good reasons for thinking the absence of history could not in every case be due to bad memory or false diagnosis. Butler therefore suggested exposure to "attenuated or minor doses of infection" to account for the apparent immunity of some of these public schoolboys. Thus Butler 15 years ago enunciated the theory of natural vaccination from a study of the one disease I used to use as an example of its non-occurrence. More recently Halliday[8] has analysed the

spread of measles in Glasgow, and thinks that "infinitesimal doses" of measles virus were received "in such a way and at such intervals of time as to build up an immunity." Even measles therefore may fall into line with the other droplet-borne diseases in which immunity may be acquired instead of illness, provided the infective material is not received too fast.

IMMUNITY FOLLOWING COLDS AND INFLUENZA.

It is often assumed that an attack of influenza or one of the other minor respiratory diseases confers no subsequent immunity. Yet herds as distinct from individuals show marked resistance to the spread of these infections. Nobody who has lived in ships with his eyes open and has seen a ship's company turned in for the night can believe that those who are not attacked by a droplet-borne epidemic in a ship escape because they have avoided all contact with the infective agents. Even in the big influenza epidemic of 1918 50 per cent. or more of a ship's company generally escaped attack.[9] Since 1918 there have been many minor influenza epidemics in ships, all extremely mild clinically and rarely attacking more than 10–15 per cent. of the ship's complement. Also, although the cases were always distributed throughout all parts of the ship, which showed that the infection was general, yet more than 80 per cent. of the men had sufficient resistance to absorb all the doses of influenza virus which they must have received without suffering from any apparent ill-effects. The same distribution and the same escape of the majority can also be seen in outbreaks of simple sore-throat and even colds in the head.

The reasons why the impression that attacks of the minor respiratory ailments can confer no increase of resistance is so general are that many individuals get attacked over and over again at short intervals; on the other hand, many do not; but it is the former group that impresses itself on the attention of medical men. In such a trivial infection as the common cold reliable statistics are hard to come by, because probably not 5 per cent. of colds cause incapacity for work, are remembered by the victim, or seen by a doctor. Also in such a ubiquitous and recurrent condition it is impossible to estimate an increase in herd immunity by the absence of subsequent attacks; but if it could be shown that the frequency of colds varied inversely with the amount of previous bacterial experience it would be good evidence that herd immunity to the minor respiratory diseases could be increased. My own work has shown that the attack-rate for influenza is greater among recruits than seasoned men [10] living under the same conditions, and also that the other minor respiratory infections which were sufficiently severe to cause an entry on the sick lists are three times as common in training establishments as in sea-going ships, though the latter have a much denser population.[11] Very interesting evidence that herd immunity to the minor respiratory diseases can be acquired is also to be gleaned from the reports of the United States Public Health Services.[12] In a sample of the population a census was taken of all the colds in the head that occurred during the course of one year. The results indicated that, between infancy and 20 years of age, the frequency of "colds" falls from an average of over two colds per person per annum to under one per year.

Definite evidence on the point that any increase in herd immunity, however small in degree, does occur by natural infection in the minor droplet-borne diseases is of paramount importance, because it encourages perseverance in the search for an efficient prophylactic vaccine against these ailments by imitating and improving on the natural process.

THE EXAMPLE OF DIPHTHERIA.

In order to show what might be possible in the future if a really good anti-catarrh vaccine could be discovered, I have made Fig. 1 to represent what can be done now with a diphtheria prophylactic. This diagram represents what happens to an average sample of 100 Schick-positive reactors (i.e., individuals with a low resistance to diphtheria), when they are exposed to a natural diphtherial environment, compared with the results of inoculation with diphtheria toxoid. C may be taken to represent an average London day school. In the course of ten years 40 per cent. of susceptibles will have acquired immunity by autovaccination, and by latent and evident infection. In the residential school B, which represents the result of an average three years at Greenwich Hospital School, double the number become immune in a third of the time required in C, but at a cost of one case for every three immunised. Column A is based on results of artificial active immunisation, and shows that a better result can be obtained in at least one-sixth of the time which was required in environment B, and without any accompanying diphtherial morbidity such as B and C produced. The continuous lines in the diagram represent the slow augmentation of natural herd immunity with time, in contrast with its rapid production by artificial means. The dotted lines indicate the gradual accumulation in the B and C samples of cases with a past history of diphtheria. The table in the centre of the diagram is a kind of balance sheet. The figures were estimated from the Greenwich data, and from figures given by Graham Forbes [13] in his report on the Prevention of Diphtheria. The efficiency index is merely an arbitrary number which is obtained on the debatable assumption that the value of an immunising agent varies directly as the percentage of immunes produced, and inversely as the time taken and the number of symptomatic infections which occur during that time.

Fig. 1 was introduced to show how a good man-made prophylactic excels nature in the rapidity of its action, and in its small cost to the community in pain, time, and money. Since we have evidence that the minor respiratory infections do cause, even if only a little, increase in herd immunity there is no reason why research and perseverance should not some day produce a prophylactic which would excel natural auto-vaccination in colds to the same extent as is the case in diphtheria, and when this millennium arrives the minor droplet infections should be almost as easy to prevent as diphtheria is now, when full use is made of modern methods. A good vaccine is, par excellence, the ideal method of increasing the resistance of the herd to droplet-borne infection. Methods which remove all bacteria from the environment depend on keeping the barrier between them and the herd inviolate. They are purely defensive methods against an enemy air force, who, if he should penetrate them, may find a people completely unversed in war at his mercy. An efficient vaccine, on the other hand, is an improvement on Nature's methods, whereby a short course of intensive training in the war against air-borne disease is given to the herd in order to enable it to destroy the enemy rather than run away from him.

AVAILABLE MEANS OF COMBATING AIR-BORNE INFECTION.

Until the perfect vaccine materialises it is necessary to use any other method which may be available to combat the prevalence of droplet-borne infections. Although bacteria cannot be prevented from polluting the air, yet if the average distance between the members of the herd can be sufficiently increased symptomatic infection will be considerably reduced; and provided that the individuals in a community are not allowed to receive too many, or too large, droplets, good may actually result by an increased resistance of the herd as a whole to the spread of infection. Moreover, if it is true that it often requires considerable time to collect a dose of infective material sufficiently large to initiate an illness, it becomes advisable to do all that is possible to increase the distance between individuals in those places where, of necessity, they remain for many hours in the same position relative to each other. Bed is the place where human beings remain stationary longest. For this very fact space

is more likely to be economised in sleeping quarters then elsewhere.

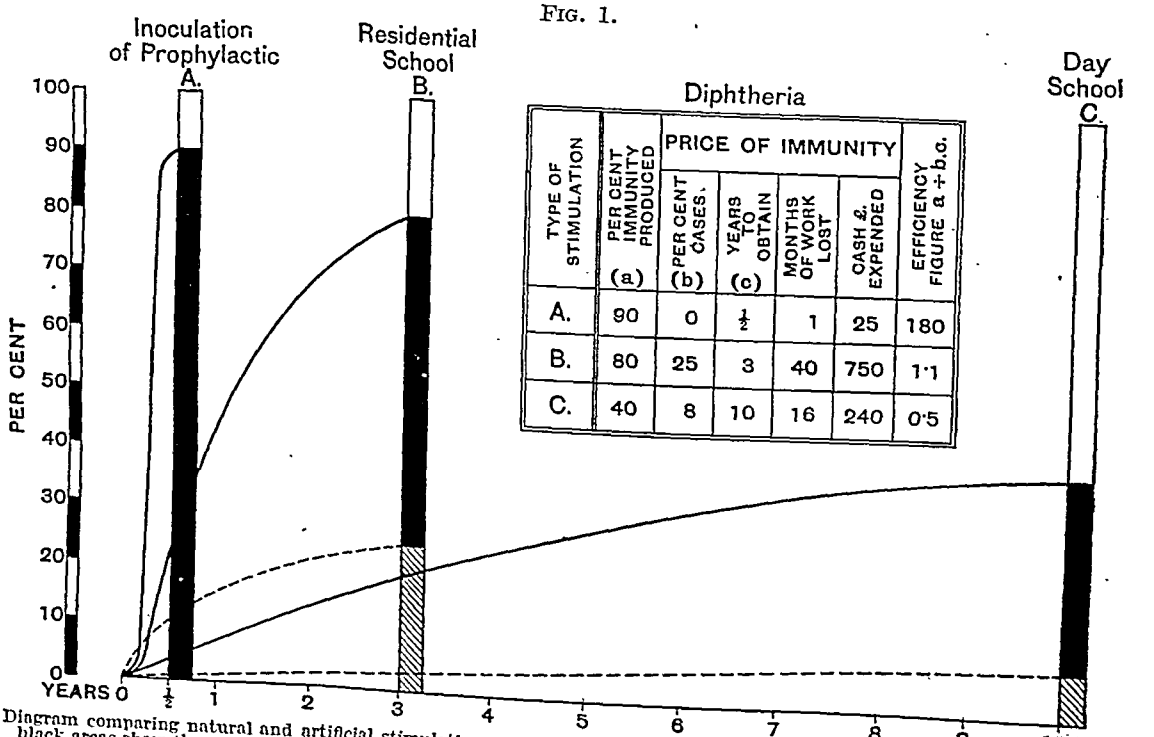
Common sense, without any knowledge of hygiene or bacteriology, would suggest that if you are not moving for eight or more hours, 2 ft. by 6 ft., just room to stretch out in, should be enough space for anybody, and if other members of your herd are sleeping with you, the closer you can get together the warmer you will be. This logic is applied so literally in winter in Northern China that the excessive overcrowding at night becomes a great help to the bacillus of pneumonic plague in its search for new hosts. The early hygienists recognised there was something wrong with this doctrine, and strongly urged the necessity for fresh air, in order to remove the CO_2 and mysterious noxious human exhalations. They undoubtedly did an immense amount of good, though their reasons for the necessity of a liberal supply of air are now known to be false.

The older researches on atmospheric vitiation resulted in the standards of space required to maintain health being given in cubic feet. I think anyone who has followed recent work will agree that cubic capacity per se is not nearly so important as the average linear distance between the respiratory orifices of the individuals who occupy any area. Linear distance is necessary in order to keep out of range of the heavy jets of infective droplets which may be expelled by the forcible expiratory efforts of a potential case or carrier of infection. To escape this heavy jet, beds should be as far apart as possible, and if four or more feet is insisted on between the edges of beds, the old standards of floor space and cubic capacity perforce have to follow. That increasing the space between beds will prevent infection is better illustrated by Glover's[14] original demonstration than by any other work. Epidemic meningitis was completely stamped out of soldiers' camps by merely increasing the distance between their beds from a foot or under to 2·5 ft. Droplets were still able to cross the wider gap, but in smaller doses, which still produced a few carriers but were unable to initiate an attack of meningitis. It is important to realise that the soldiers drilled, ate, and played exactly as before, the only alteration in their mode of life was that they slept further apart. A caution is required against applying data derived from one kind of herd and race of bacteria to others. 2·5 ft. was sufficient to prevent meningitis in soldiers, but 3 ft. was insufficient to prevent the same disease in boys of more susceptible age in the naval training establishments.[11] Again, substitute small-pox for meningitis, and the beds would probably have to be put in different streets in order to prevent cross-infections.

Efficient Ventilation.

It is highly probable that diseases with a higher striking distance, such as chicken-pox, measles, and some types of the minor respiratory group, may be also propagated to an unknown extent by the more permanent travelling cloud of the smallest droplets as well as by the momentary but heavy short-range jet. Here we see the real necessity for efficient ventilation. A good flush of fresh air acts in two ways: first, it sweeps out the infected droplets, and, secondly, it prevents the humidity of the air being raised during the night by the water continually added to it from the lungs and skins of the sleepers. Other things being equal, the wetter the air the longer the droplets persist in it, which may be a clue to some of the effects of climate and weather on the incidence of disease. Just as space for health purposes means linear distance rather than cubic capacity, so also ventilation does not depend on the volume of space per se, but on the frequency of change of air. In the Royal Navy, by force of circumstances, linear space may be considered practically non-existent, and of necessity we are forced to rely almost solely on efficient ventilation. The following incident illustrates the meaning of efficient ventilation. In the small hours of a tropical night, during a gale, when all hatches were battened down, I visited a mess desk in a cruiser where 60 stokers, men of above the average physique, were sleeping in a space which ashore would have been considered only adequate for ten school-boys, yet the air was sweet and fresh in comparison to that in many

FIG. 1.



TYPE OF STIMULATION	PER CENT IMMUNITY PRODUCED (a)	PRICE OF IMMUNITY: PER CENT CASES. (b)	YEARS TO OBTAIN (c)	MONTHS OF WORK LOST	CASH £ EXPENDED	EFFICIENCY FIGURE a ÷ b.c.
A.	90	0	½	1	25	180
B.	80	25	3	40	750	1·1
C.	40	8	10	16	240	0·5

Diagram comparing natural and artificial stimulation of immunity. The columns represent 100 original susceptibles. The black areas show the percentage immunised, and the shaded areas the percentage notified as having contracted diphtheria.

a fair-sized English bedroom which has been occupied for the night by an individual who fears the winter night air. The reason was that the total air on that stoker's mess deck was changed every two minutes; 100 cubic feet of space with the air changed 30 times an hour gives the same air-supply as the usual standard of 1000 cubic feet changed three times per hour. Although in the Royal Navy a microbe in its droplet has a very small gap to cross to get to its next host, yet it has to be very smart in doing so to escape being swept out through the exhausts into mid-ocean.

Environment by Night and by Day.

I have purposely stressed the spread of disease in sleeping quarters since there is no doubt, other things being equal, especially space, disease will spread easier there than elsewhere, because in sleeping quarters there is more time for droplets and water vapour to accumulate and more time for boys to collect adequate infective doses. Also mouth-breathing in sleep is common, resulting in snoring, which on one hand aids distribution of infection, and on the other, by short-circuiting of the nasal defence mechanism, makes reception of infection easier. But because I have stressed sleeping quarters it does not mean that no infection occurs elsewhere. If class-rooms and recreation spaces are damp and muggy they may become more dangerous environments than a spacious dormitory. Plenty of infection is contracted in day-schools, but in general less than in boarding-schools. For example, the population of the L.C.C. day-schools and Greenwich Hospital School are the same social class. The average age of an L.C.C. child is about 10 against 14 at Greenwich. The class-rooms and the playground are more spacious and the general hygiene better at Greenwich than in the average L.C.C. school. Also, Greenwich boys are a physically selected population, since most of them are expected to be fit to serve subsequently in the Royal Navy. Therefore age, physique, and day environment are all greatly to the advantage of Greenwich Hospital compared with the L.C.C schools. Yet during the years 1919 to 1927 the average diphtheria morbidity of the residential establishment was five times as great as the day-school morbidity (i.e., 450 compared with 83 per 10,000 per annum).

Watts[15] describes an epidemic of infantile paralysis in the schools of Broadstairs. An examination of his figures show if the schools are divided into (1) solely residential, (2) mixed boarding and day, and (3) solely day-schools, the residential produced 15, and the mixed schools 8, to each single case which was notified in the day-schools.

The magnitude of the differential morbidity for diphtheria and poliomyelitis in day- and boarding-schools strongly suggests that night environment is more important than day environment, and that the night environment in many residential schools must be most favourable for the spread of droplet-borne infection. Glover,[16] in an interesting paper on the spread of naso-pharyngeal infection (i.e., droplet infection) in schools, came to the same conclusion that in many public schools the dormitories were the favourite site of selection for bacterial dissemination. Dr. G. E. Friend,[17] in the subsequent discussion of this paper, stated that at his school he was certain that the dormitories were not the chief sites of infection. I confess the opinion of so experienced a school medical officer rather depressed me until I saw the plan of one of Dr. Friend's dormitories, when I felt very relieved because it supplied a piece of evidence I was in need of—namely, how much extra space is necessary to make a practical reduction in the incidence of droplet-borne diseases in sleeping quarters. With Dr. Friend's permission I have made (see Fig. 2) a copy of his bed plan of a dormitory where there was no evidence of bed to bed spread, in order to compare it with one, drawn to the same scale, where such evidence was overwhelming. Both rooms have adequate cross ventilation. The upper plan shows that a distance of 5 feet between the edges of adjacent beds is possible, which is double the space between the beds in the lower plan. Moreover, there are 126 beds in the latter in contrast to 24 in the upper plan. It is obvious that if infection is introduced into a room it will tend to be limited to the occupants of that room, hence the smaller the number per room the better, until the ideal is reached of one boy one bedroom. 126 is, in any case, too many eggs to have in one basket.

The upper plan as drawn shows the 24 beds are broken up into eight groups of three, with about 9 feet between groups. This scheme imitates eight separate rooms of three boys each, with less space between boys, in contrast to a possible arrangement making one dormitory for 24 boys with 5 feet between beds. The arrangement in groups is a compromise between the two principles of as few eggs per basket as possible, and as much space as possible per egg. Much careful observation would be needed to decide which method of spacing had the best effect on morbidity. Probably a complete spacing would be more efficacious in limiting the spread of some infections, and the grouped system for preventing others. As a mere guess I should say the grouped arrangement of beds as shown would be the more efficient scheme for diminishing the total incidence of all infections taken together, especially if each group is arranged to consist of boys of the same length of residence in the school.* Before leaving Fig. 2 I would like to point out that it represents one of the many pieces of evidence which incriminated sleeping quarters as a favourable environment for the spread of droplet infection. The black rectangles in the lower diagram represent the beds which were occupied by the victims of a scarlet fever outbreak. Notice that 12 out of 17 cases are confined to one corner of the room, and that these 12 all occupied adjacent beds, and the first 17 patients were confined to one-half of the dormitory. Hence it seems as if the 9-foot gangway, between the two halves of the room, was a sufficient barrier to the spread of the infection. Finally, a fortnight after the seventeenth case, two fresh cases of scarlet fever occurred in the previously uninfected half of the room, but these cases caused no others, conceivably because the occupants of the previously uninfected half of the dormitory had been vaccinated by sub-infective doses in the droplets which floated over from the infected half.

Suggestions for Reforms at Schools.

While there is no intention of belittling other methods, the fundamental principle in preventing droplet infection is linear space, aided by rapid change of air. But more space means more money, which in these days of economy is rarely forthcoming. However, the practical remedy is really so sensible, simple, and inexpensive that I am afraid no one will take it seriously. Most public schools have spacious grounds; why not let the boys sleep in them, and then use the old sleeping quarters to expand the class and recreation rooms? Cannot someone overcome the deeply rooted tradition of the average Englishman that he must sleep completely boxed in by four walls and a roof? If all boys slept in the open, in addition to a big drop in the incidence of all diseases there would be a marked increase in mental and physical agility.

In addition to the fundamental principle of as much space as possible, there are two other factors that can be made use of in combating air-borne infection. The first is, that since it may often take time to catch a disease, work periods should be short, with adequate intervals to fully flush out lungs and class-rooms with fresh air. Secondly, the recruits to a school have in general far less resistance to infection than the more senior boys. A superstition that men require more room than boys, and old boys more space than young boys, still lingers on from the days when a low CO_2 percentage was considered to be the chief essential of a healthy atmosphere. I suppose, if in any school there happened to be two groups of boys of equal numbers but different seniority, who were being

* Dr. Friend has informed me that this is done as far as possible. This, then, is another reason why his dormitories are unfavourable sites for bacterial dispersal.

allocated two dormitories of unequal size, the senior boys would be invariably given the more spacious room, which is wrong from the prevention of infection viewpoint. Again, in those schools which use both dormitories and single bedrooms, the latter, of course, are the perquisites of the more senior boys, though they must be more seasoned to their environment than the juniors. Of course, it is a reductio ad absurdum to give a new boy a suite of apartments and pile the whole upper sixth into one attic; but it might be feasible to use the available space to better advantage without necessarily increasing it, by evolving some scheme whereby the space allowed per boy would tend to increase from the top to the bottom of the school, instead of vice versa, as is usual at present. Anyhow, every attempt should be made to give more room to first and second term boys. For instance, at Greenwich Hospital School the incidence of diphtheria among first and second term boys was relatively five times as great as in the rest of the school (third to twelfth term boys). I honestly believe if only one could strike the right space gradient, both the morbidity and the ratio of symptomatic to symptomless infection could be markedly decreased without having to provide any additional accommodation.

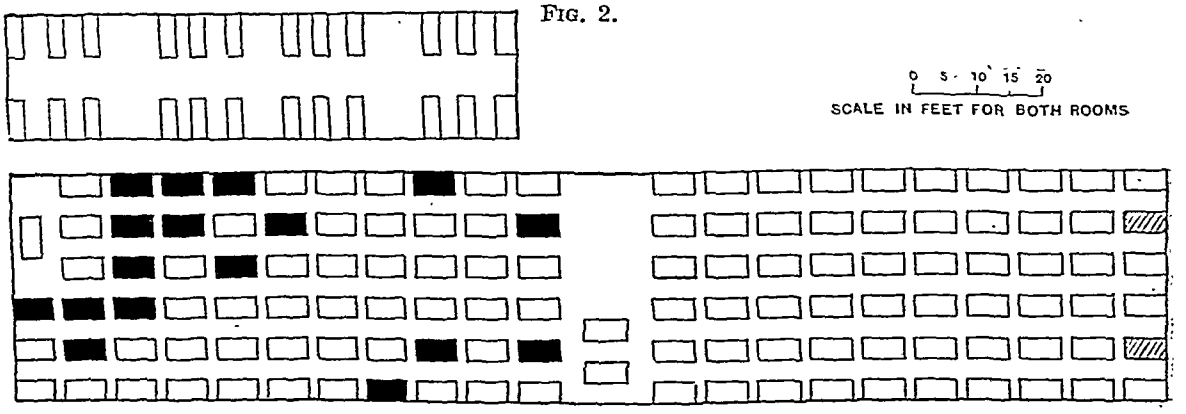


FIG. 2.

Diagrammatic representation of the arrangement of beds in two school dormitories. The upper one, in which there was no evidence of droplet infection, had a floor space of 60 sq. ft. per bed, the average distance between the edges of the beds being 5 ft. The lower, in which there was much evidence of droplet infection, had a floor space of 43 sq. ft. per bed, the average distance between the beds being 2·5 ft. The black rectangles show the beds occupied by scarlet fever cases between Oct. 18th and Nov. 13th, 1921, whilst the shaded rectangles show the beds in which the disease appeared between Nov. 21st and 24th.

RISKS OF INTERFERING WITH NATURE.

I will conclude my paper with something in the nature of an anticlimax. Perhaps we are approaching, or have in some environments already reached, a condition of affairs where from a broad point of view it may be inadvisable to reduce droplet infection any further. There are many examples in economic biology of the danger of interfering with the balance of nature without careful calculation of the possible results. Elton [18] quotes an interesting example which is somewhat parallel to our problem. A sanctuary was made for the deer in Arizona, and the wolves and cougars, the natural enemies of the deer, were killed off. During the summer, in the absence of their natural enemies, the deer multiplied to such an extent that they would have consumed all their winter feed, and might have all starved before the following spring, if man had not stepped in and shot all but a sufficient number to maintain the species over the winter. As Elton tritely puts it: "The natural enemy of the individual deer was the real friend of the herd." In droplet infection two processes are continually at work, the production of illness which we wish to prevent, and increase of herd immunity which is to be encouraged, as it is a most useful asset in post-school life, and to the species as a whole. The trouble is, that just as the amount of disease is a function of the bacterial density, so is the amount of stimulated immunity; and in our present state of knowledge we cannot encourage the latter without increasing the former. Broadly speaking, under present conditions, even if many boys lose a few weeks' schooling from minor illnesses, as far as we know the vast majority suffer no permanent harm. The few that do contract a heart lesion, or other permanent disability, must be sacrificed if necessary for the benefit of the many. Preventive medicine deals with the herd, not the individual. Doctoring in general is such a personal matter, more especially in ships and schools than elsewhere, that it is hard to steel one's self to sacrifice individuals for an abstract benefit to the community.

In my own service I would be very loth, even if it was possible, to banish all droplet infection from the training establishments. It is there the young British sailor is made into a seasoned man, not so much by good food and physical training, but by adaptation to the bacterial environment in which he has to spend his future career. The epidemic of meningitis during the Great War is a good instance of the seasoning effect of the naval training depôts. Overcrowding is rightly considered a most important factor in the spread of cerebro-spinal meningitis, as Glover's work previously referred to definitely proved. Although the boys in training establishments often slept in beds as much as 3 feet apart, while the men in the fleet sleep in hammocks with not as many inches between them, yet the morbidity in the training establishments was 36 times greater than at sea, in spite of the great congestion in the ships on active service. The paradox, is, however, easy to explain. The crews of sea-going ships had all passed through the training depôts, where a few got meningitis, while the rest were rendered immune by inhaling droplets containing meningococci which were projected into the air by the hundreds of undiscovered carriers who were constantly present. In the Royal Navy our training establishments are our vaccinating centres, and if all bacteria were removed from their precincts the morbidity of infectious disease would be transferred to sea-going ships, maybe with disastrous results. Many incidents from naval history show how an infectious disease can decimate a ship's company, and many naval medical officers of to-day have had personal experience during the influenza epidemic of 1918 of what a malignant droplet-borne infection can do when let loose on the mess-decks of a battleship; it is therefore essential to the service to keep all the infectious disease we can on the beach. For use in the Royal Navy Elton's epigram might well be read as "Bacteria, the natural enemies of the sailor, are the real friends of the ship."

How far we might ever be able to strike the most advantageous balance between the enmity and friendship of bacteria is a great subject for future research

in the public health, school, and fighting services. Meanwhile it is important to note there is a very great difference between a service recruit and the majority of public school-boys. The first leaves his depôt to join a still denser population of men and droplets; it should therefore be part of his training to learn how to deal with infection. The public school-boy, on the other hand, will generally leave school for an environment which includes a single bedroom and is less crowded with men and microbes than that he has become adapted to during his school life. Moreover, in a densely populated country like England everybody comes in contact with many kinds of bacteria, and in general the longer clinical disease can be staved off the less severe it will be. Owing to a shorter average experience of bacteria, the fatality of infectious disease, other things being equal, is greater in the youngest two age-groups even when there is no difference in their respective morbidities. Such considerations, combined with an analysis of the few available statistics, make it certain that under present conditions much more good than harm will result to the vast majority of school-boys from any measures calculated to reduce the density of those microbes who prefer to travel from one host to the next in the respiratory droplets.

I would like to acknowledge my indebtedness to Surgeon-Captain P. May, whose most accurate note-taking, combined with his generosity in allowing me access to his cases and sick records, enabled me to collect much of the data on which this paper is founded.

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ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the Committee 50 applications for grants were considered and £838 19*s.* 3*d.* was voted to 47 applicants. The following were some of the cases relieved:—

M.B., aged 75, following an operation had a cerebral hæmorrhage and has been bedridden for a year. His sister, who has acted as housekeeper, is entirely dependent on him. To make a livelihood some of the rooms in the house have been let and it is hoped this will bring in an income of £120 a year if the tenants remain. Voted £40 to help over the present time of difficulty.

L.R.C.P., aged 79, married, had to retire in 1922 owing to age, and lived on a small capital which is now exhausted. His wife took up work as a visiting nurse to make a living for both. Her earnings were the only income they had. The wife is now suffering from tuberculosis and is unable to support her husband. Voted £40.

Widow, aged 65, of L.R.C.P. Since the death of her husband in 1894 has worked as a companion. She now suffers from chronic bronchitis and renal trouble. Her only income is the old age pension of £26. Voted £30.

Widow, aged 59, of L.R.C.P. This is a case of complete destitution. She has struggled for an existence doing envelope addressing, but recently she has completely broken down in health, her eyesight is affected, and she is unable to do anything. Fund granted £36 and the Guild £26.

RADIOLOGICAL TREATMENT OF CUTANEOUS BASAL CELL CARCINOMA.

WITH RESULTING TISSUE CHANGES.

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HON. RADIOLOGIST, SALFORD ROYAL HOSPITAL.

THE application of X rays has long been recognised as an effective method in the treatment of rodent ulcer. The consequent changes in the tumour cells and surrounding structures, however, is a branch of the subject which appears to have been neglected, and in the present work an attempt has been made to determine their nature. In order to obtain the clinical results of the method of treatment to be described, a series of 252 cases were examined.

In all cases, except where otherwise stated; the ulcer was first erased under 2 per cent. novocaine or procaine. The ulcer was anæsthetised at three or four points according to its size, and the needle inserted immediately external to the raised edge. The patient was then allowed to rest for two or three minutes, after which the ulcer was erased with

FIG. 1.

Before treatment (× 200). T = tumour cells.

a Volkmann's spoon. The actual scraping was performed from the periphery to the centre, particular care being taken to remove all visible traces of the raised edge. Next the centre was well gouged to a depth sufficient to ensure the clearing of its base. By this means the greater part of the neoplasm was removed, though doubtless some malignant cells still remained. The patient was then placed on the X ray couch and prepared for treatment. In view of the comparatively large dose to be administered, it was essential that all parts other than those to be subjected to the rays should be carefully protected. It has been the custom to cover the face with a sheet of rubber impregnated with lead, out of which was cut a circular piece sufficiently large to leave a margin of about ½ in. beyond the edges of the ulcer. The X ray tube was then placed at a distance of 8 in. between its anticathode and the skin. The dosage was one full Sabouraud pastille dose on each of three consecutive days to the site of the ulcer, and approximately ¼ in. of the surrounding skin. The tube used was the Coolidge type of X ray tube, and the apparatus a 16 in. X ray coil working at an equivalent spark gap of 6½ in. No filters were used.

Between January, 1923, and December, 1925, 364 cases were treated in the X ray department of the Manchester and Salford Hospital for Diseases

of the Skin, and of these 252—128 males and 124 females—were traced as having been referred to the X ray department. The average age of the patients was 58·5 years, while the youngest treated was a woman of 25, and the eldest a man of 87. Of these 252 cases, the results are as follows:—

Cures—		
Initial	170	201 (88·56 %)
Subsequent ..	31	
Failures	23	(11·44 %)
Results unknown	28	

Of those cases which were cured, initial cures occurred in 84·57 per cent. and subsequent cures in 15·43 per cent. Under the heading of initial cures are included those cases which required not more than three consecutive pastille doses and one subsequent dose to accomplish the desired result, while "subsequent cures" include those which, though eventually cured, required additional dosage to that described under the initial heading. The largest dose required to produce subsequent cure was 3 consecutive doses and 6 single doses, the whole being spread over a period of four months. Twenty-two of the series were treated without previous erasion. Seven were cured with the initial dosage, 11 were cured subsequently, while 4 were failures. Of the subsequent

FIG. 2.

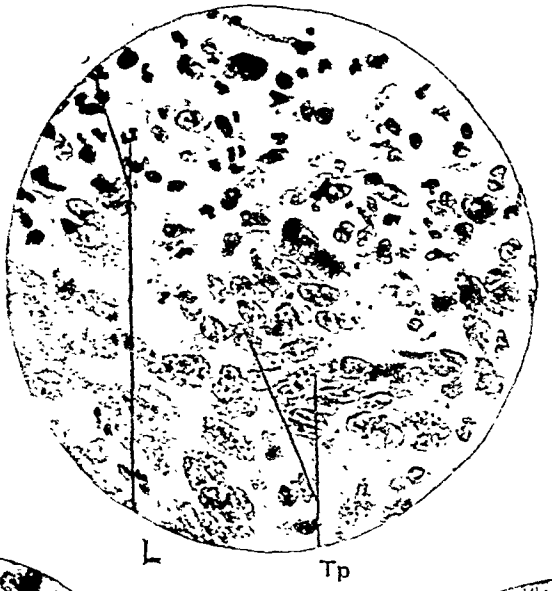


FIG. 3.

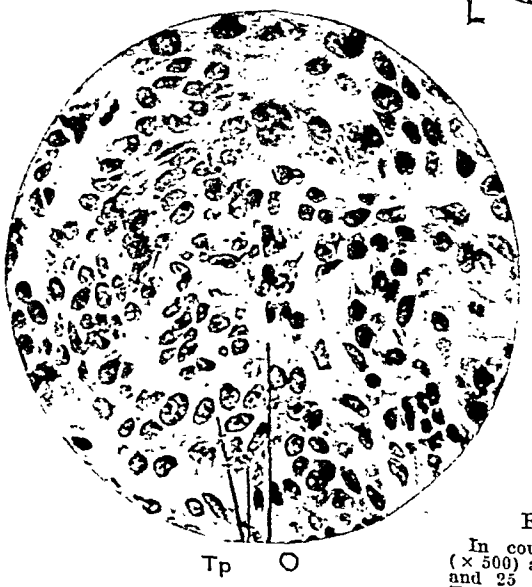
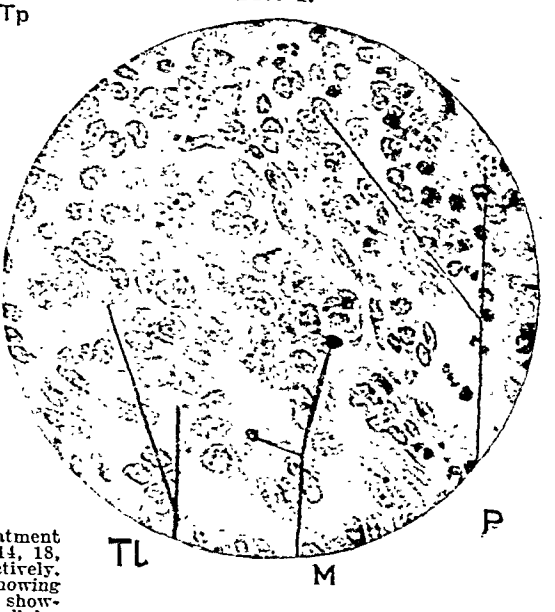


FIG. 4.



FIGS. 2–6.

In course of treatment (× 500) after 5, 10, 14, 18, and 25 days respectively. Tp = tumour cells showing pyknosis. Tl = ditto, showing lysis. O = intercellular œdema. M = mononuclear cells. P = plasma cells. Fb = fibroblasts. F = fibrous tissue.

FIG. 5.

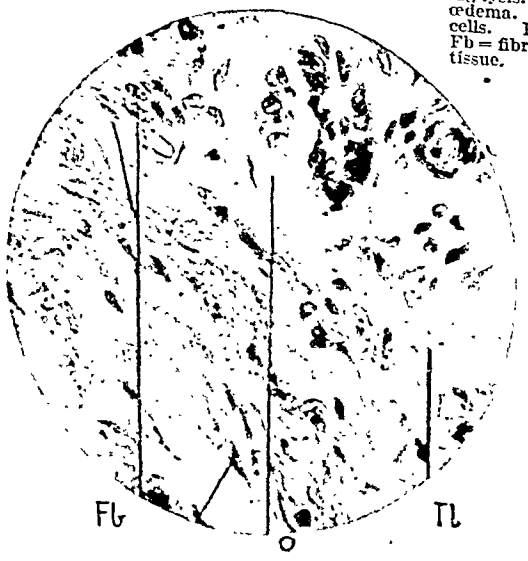
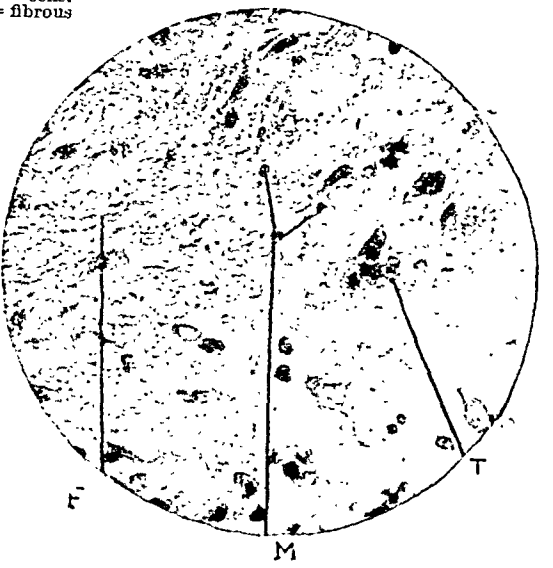


FIG. 6.



cures, one case required 23 single doses, two others 16 and 15 respectively, and a fourth 2 consecutive and 9 single doses.

Tissue Changes following Treatment.

Microscopical changes seen in the skin as the result of X ray erythema produced in the second degree reaction—i.e., as the result of three full pastille doses—appear to be closely allied with those associated with acute inflammation. Thus, in a section examined at the height of the reaction one would expect to find dilatation of the walls of the blood-vessels with swelling of the lining endothelium, thrombosis of the minute blood-vessels, transudation of lymph from the vessels, accompanied by migration of the leucocytes and lymphocytes, and other mononuclear cells (so-called small round cell infiltration), presumably derived from the proliferation of the cells of lymphoid origin. Of the actual change in human tissue cells in the acute stages of reaction, however, very little is known, although interesting studies of animal cells under the influence of the rays are available. Among the most recent works is that by H. A. Colwell and H. S. Thompson, who carried out a series of experiments on the skin of the tadpole. They irradiated the skin for varying periods through a depth of 1½ in. of water (equivalent to a filter of aluminium of approximately 3 mm.). Skin examined immediately after irradiation showed no appreciable changes, while between 24 and 48 hours afterwards the epidermal cells showed active division of nuclei with loss of definition of cell outline. The cytoplasm showed vacuolation, while numerous areas of hyperplasia were present. This mass of cytoplasm and nuclei showed signs of invading the corium. Eighty-four-hour specimens showed a marked increase of hyperplasia, but no degenerative changes were seen at this period, though the cells gave the impression of being smaller and less active. Seven-day specimens revealed a condition of complete atrophy of the epidermis with entire absence of cell formation.

It thus appears that irradiation of the skin of the tadpole under certain conditions results in temporary hyperplastic changes with increased nuclear activity, to be followed in the course of seven days by complete atrophy of the epidermis.

Mottram,[1] dealing with the action of β rays of radium (which correspond to the medium X rays and are identical in their action) on the cells of mouse sarcoma No. 180, found an early enlargement of the nuclei accompanied by abnormal mytosis. This he[2] attributes to increase in the hyaline material of the nucleus; and he found that normal tissue cells presented the same change.

In order to determine the changes occurring in the cells of rodent ulcer as a result of the treatment used in the cases previously described, the following microscopical examinations were carried out:—

A series of five sections were taken from different unerased ulcers at intervals of 5, 10, 14, 18, and 25 days respectively after the first day of treatment. In order to confirm the microscopic findings, five complete series, totalling 25 sections, were examined. In none of the sections was dilatation of blood-vessels actually detected, while no endothelial swelling and no thrombosis of minute vessels were found. The cell outlines were not defined and no vacuolation of the cytoplasm, as occurred in the experiments of Colwell and Thompson on the tadpole, was observed. The most striking changes appeared in the cell nuclei and the areolar tissue lying between the masses of tumour cells.

Five-day Sections.—Sections taken five days after the commencement of treatment showed a marked infiltration of polymorphonuclear leucocytes in the areolar tissue between and around the tumour cells. The former also showed signs of commencing œdema between the cell masses. The nuclei of the tumour cells showed signs of commencing pyknosis, or increase in the staining reaction of the chromatin granules within the nucleus.

Ten-day Sections.—The 10-day sections indicated an aggravation of the nuclear changes seen in the previous sections—namely, marked pyknosis. There were also definite changes in the contents of the areolar tissue. The number of polymorphonuclear leucocytes was markedly diminished, while an appreciable number of plasma cells had now appeared. Œdema of the areolar tissue was considerably more marked. At this period there was no appreciable lysis of the nuclei of the tumour cells.

Fourteen-day Sections.—These revealed the presence of a large number of plasma cells and other mononuclear cells, which had almost completely replaced the polymorphonuclear infiltration in the areolar tissue and intercellular spaces. The plasma cells were characterised by the cart-wheel arrangement of the granular deposits within the nuclei. Lysis of the nuclei of the tumour cells was now well marked, a large number showing signs of degeneration, as indicated by their relatively faint staining reaction, while the œdema had spread to the intercellular spaces.

Eighteen-day Sections.—These showed no marked changes in the areolar contents, though the intercellular œdema was still more pronounced. A large proportion of the nuclei of the tumour cells had now disappeared, while others were still undergoing lysis. At this period a new feature was noticed—namely, the appearance of fibroblasts in the intercellular spaces. Thus the action of the rays had evidently reached and probably just passed the point of greatest intensity, and we see the process of destruction and repair proceeding side by side.

Twenty-five-day Sections.—The intercellular œdema had apparently subsided. A number of fibroblasts and a considerable amount of fibrous tissue were present and, except in one case, very few tumour cells. A diminution in the number of plasma cells and mononuclear cells was also noted. This increase in fibroblasts and fibroblastic tissue was possibly due in part to their transformation from the plasma cells, which also accounts for the diminution in the number of the latter. The number of tumour cells present at this period varied according to the degree of destruction and appears to be dependent on the depth and to a lesser degree the extent of the unerased neoplasm.

Theoretically, at this period, all tumour cells should have disappeared completely, and their presence in these sections requires some explanation. It has been my experience that considerably larger dosage is required to cure ulcers which have not been previously erased. The sections examined in the present series come under this category and did, in fact, require more than the standard three consecutive doses to produce an eventual cure, owing to the greater tissue depth to be penetrated by the rays. In one of the sections examined 25 days after the three consecutive doses, a large number of tumour cells were still present, lying generally in groups and surrounded by fibroblastic cells and actual fibrous tissue. It seems evident that this case had been definitely underdosed.

Conclusions.

If we trace the progressive tissue changes seen in the respective groups of sections the following facts become apparent: (1) The early action of the rays on the skin structures is seen in the appearance of polymorphonuclear leucocytosis as early as the fifth day. (2) Progressive intercellular œdema occurs up to the eighteenth day. (3) Lysis of the nuclei of the tumour cells begins on the tenth day, with a maximum lysis on the fourteenth day. These two facts (2 and 3) demonstrate beyond reasonable doubt that three consecutive pastille doses of X rays, in their action on the tumour cells of rodent ulcer, reach their maximum intensity on or about the fourteenth day. (4) The process of repair, indicated by the appearance of fibroblasts, has definitely begun 18 days after the commencement of treatment. (5) The presence of tumour cells as late as the twenty-fifth day seems to prove that three consecutive doses on the unerased ulcer is not a sufficiently large dosage to ensure a certain cure without danger of relapse. In one case, indeed, the ulcer appears to have been definitely underdosed.

Owing to the impracticability of removing sections from definitely healed ulcers, none of the end-results of treatment is available.

[1] Mottram, J. C.: An Early Change in the Nucleus of the Cells of Tumours following Exposure to Beta Radiations, Brit. Jour. Radiol., 1927, xxxii., 61.

[2] Mottram, Scott, J. G., and Russ, S.: The Effects of Rays from Radium upon Division and Growth of Cancer Cells, Proc. Roy. Soc., Series B, 1926, c., 326.

EXERCISE TESTS IN PULMONARY TUBERCULOSIS.

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THE best way to obtain control of pulmonary tuberculosis is by rest. Once control has been obtained the object of treatment is to get the patient back to his previous occupation or to as useful a life as possible, without undue risk of a further breakdown. The great difficulty is to estimate how much physical exertion can be allowed with safety. All available criteria of improvement fail and we are driven to observing the response to carefully increased exercise. How far exercise should be pushed in testing out a man's fitness is a greatly debated question, but in a working-class sanatorium, where the aim for many is a return to a life of manual labour, it is essential to include manual work as a test. It is the practice at Frimley to start patients on graduated manual labour when they have satisfactorily completed a sufficient amount of walking exercise. It is frankly admitted that graduated labour involves more risk than walking exercise. In practice, however, it is found to have advantages which outweigh the added risk,[1] and available statistics[2] show that the after-results in patients treated by graduated labour are at least as good as when it is not employed. By instruction and supervision care is taken that patients only do exercise that they can manage comfortably. Their coöperation must be secured. Unless they are supervised some will take exercise too strenuously and some will slack. For walking exercise instruction is given that no one is to exceed a speed of half a mile in ten minutes, and as much longer as necessary is allowed to avoid discomfort, such as fatigue and dyspnœa. In doing work, mostly gardening but also handicrafts such as carpentry, boot-making, and painting, it is emphasised that no attempt is to be made to get a job done, but that the object is to obtain exercise which is easily within the patient's power. All exercise has to be carried out at an even rate; spurts and stops are to be avoided.

In estimating a patient's fitness for increased exercise several factors have to be considered: (1) symptoms—those volunteered and those secured by careful questioning; (2) temperature, pulse, and weight records; (3) type, condition, and extent of the lesion; and (4) general condition, physique, and occupation.

In addition to these, tests of the reaction of the pulse-rate to exercise will be a great help. Immediately on completing a given amount of exercise the temperature, pulse-rate, and respiration-rate are taken. The patient remains at rest, and the pulse-rate is taken five minutes later and again in half an hour. The temperature also is taken again in half an hour if it showed an initial rise.

To test the efficacy of such exercise tests we devised the following scheme. We took 100 consecutive cases who walked four miles morning and afternoon (men) and three miles (women), and classified them as satisfactory or unsatisfactory cases. We then compared the exercise tests of these two groups. That level of exercise was taken as the standard, because to reach it patients had to be in a fairly stable condition, and because by then they were more accustomed to tests. Hence the tests should be more reliable. The division into satisfactory and unsatisfactory cases was made from the information available within a few days of their admission to the sanatorium. Thus we had a comprehensive history, X ray and physical sign findings, notes on symptoms and general condition, and the result of sputum examinations. Cases likely to respond well to treatment and in whom the ultimate prognosis seemed good we classed as satisfactory; the others as unsatisfactory. Of the 100 consecutive cases 40 were grouped as satisfactory and 60 as unsatisfactory. The exercise tests were classified as good, intermediate, and bad.

Good.—The pulse-rate falls to within ten beats of the resting pulse-rate within five minutes of stopping exercise. No rise of temperature. No dyspnœa. The following is an example:

Initial pulse-rate ..	.. 88	Pulse in 5 minutes	.. 76
Respiration ..	.. 18	Resting pulse ..	.. 70
Temperature ..	.. 98·2		

Intermediate.—The pulse-rate falls to within ten beats of the resting pulse-rate within half an hour of stopping exercise. No rise of temperature. No marked dyspnœa. Example:

Initial pulse-rate ..	.. 94	Pulse in—	
Respiration ..	.. 20	5 minutes ..	.. 88
Temperature ..	.. 98·4	30 minutes ..	.. 76
		Resting pulse ..	.. 70

Bad.—The pulse-rate does not fall to within ten beats of the resting pulse-rate within half an hour. There may be a rise of temperature and dyspnœa. Example:

Initial pulse-rate ..	.. 110	Pulse in—	
Respiration ..	.. 24	5 minutes.. ..	.. 100
Temperature ..	.. 98·6	30 minutes ..	.. 88
		Resting pulse ..	.. 70

The initial pulse-rate is disregarded in the classification. Observation of a great number of cases showed that very few did not show an initial rise of pulse-rate.

In the satisfactory cases the exercise test results were:—

Good .. 13 (32½%). Intermediate .. 25 (62½%). Bad .. 2 (5%).

In the unsatisfactory cases the exercise tests were:

Good..11 (18⅓%). Intermediate..19 (31⅔%). Bad..30 (50%).

This clearly indicates the value of these exercise tests, when classified in this way, because among satisfactory cases there were only 5 per cent. of bad tests, as against 50 per cent. among the unsatisfactory. Among the satisfactory cases those who did intermediate or bad tests could be more closely watched and their exercise more gradually increased. Those in the unsatisfactory group whose tests were good might have their exercise increased with safety.

We decided to try another method of estimating the efficiency of exercise tests. We consider that patients with normal temperatures are unlikely to be toxæmic, and therefore they should do satisfactory tests. A normal temperature was strictly judged. For instance, a swing of more than 1½°, a subnormal temperature, and a temperature with an occasional spike to even 98·8° were all excluded. In 50 consecutive cases with normal temperature charts the exercise tests results were:

Good .. 19 (38%). Intermediate .. 26 (52%). Bad .. 5 (10%)

Thus the tests are again found reliable.

Examples of Tests.

1. *Very Good Tests.*—These were done by patients in a stable condition, who were making excellent progress (Table I.).

TABLE I.

Test.	I.P.	R.	T.	P. in 5 mins.	P. in 30 mins.	Resting pulse.
(a) 4 miles walking, A.M. and P.M. ..	78	18	98	78	76	70
(b) Grade 4 (heavy work)	76	18	98·2	74	74	70

I.P. = Initial pulse-rate; R = respiration; T = temperature.

[1] Wingfield, R. C.: Modern Methods in the Diagnosis and Treatment of Pulmonary Tuberculosis.

[2] Medical Research Council, Special Report Series, No. 33 and No. 35.

2. Improvement in tests with increasing exercise concurrent with general improvement (Table II.).

TABLE II.

Test.	A. I.P.	A. R.	A. T.	A. P. in 5 mins.	A. P. in 30 mins.	B. I.P.	B. R.	B. T.	B. P. in 5 mins.	B. P. in 30 mins.
1 mile walking, A.M. and P.M.	108	20	97	96	88	116	24	98	110	100
4 miles ditto ..	90	18	96	84	88	100	20	98·4	92	84
Grade 1 (light work)	82	18	97·6	86	84	90	20	97·6	90	86
Grade 4 (heavy work)	78	18	98·4	80	78	78	16	97·8	76	—

In the early stages of exercise more latitude must be allowed in estimating the exercise tests. As a result of bed treatment, the muscle tone is poor and the heart is unaccustomed to the strain of exercise, and in consequence a *non-toxæmic tachycardia often occurs.* This tachycardia disappears as the muscles and heart muscle become attuned to exercise.

3. Tests showing a toxæmic condition (Table III.).

TABLE III.

Test.	I.P.	R.	T.	P. in 5 mins.	P. in 30 mins.	Resting pulse.
Walking A.M. and P.M.						
1 mile	112	20	98·6	100	100	80
2 miles	128	18	98·2	102	100	80
3 ,, ...	132	22	97·6	114	94	80
3½ ,, ...	116	24	98·4	112	100	80

All the evidence in this case, excepting that of the tests, indicated improvement. A severe breakdown occurred when the patient reached the stage of the last test. Compare these tests with those in group 2, where the tests improved with the patient's general improvement.

4. Tests influenced by a mechanical factor (Table IV.).

TABLE IV.

Test.	I.P.	R.	T.	P. in 5 mins.	P. in 30 mins.	Resting pulse.
Walking A.M. and P.M.						
(*a*) 2 miles ..	120	22	98·4	100	80	80
(*b*) 4 miles ..	124	24	97·6	110	88	84

(*a*) A case of marked right-sided fibrosis with the heart displaced to the right.

(*b*) A case of fibrosis and cavitation of left lung with heart displaced to the left.

In the last two exercise tests it will be observed that the initial pulse-rate is high, that there is a definite fall in five minutes and a return to almost resting pulse-level in half an hour. This type of test is typical of a fair number of cases in which there is much fibrosis and heart displacement, or in which there is extensive disease, so that the heart has to contend with mechanical difficulties. Many such patients, however, do normal tests.

TABLE V.

Test.	I.P.	R.	T.	P. in 5 mins.	P. in 30 mins.	Resting pulse.
Walking A.M. and P.M.						
(*a*) 2 miles ..	122	20	98·2	120	108	80
(*b*) 4 miles ..	106	24	97·8	98	96	80

When, in addition to the mechanical factor, there is also a toxæmic one the pulse-rate does not come down in half an hour to the resting pulse-rate level (Table V.).

When the difficulty is purely mechanical, slowly and carefully increased exercise will often secure a fall in the high initial pulse-rate (Table VI.).

TABLE VI.

Test.	I.P.	R.	T.	P. in 5 mins.	P. in 30 mins.
Walking A.M. and P.M.—					
1½ miles	128	20	98·2	110	88
3 ,, ...	122	20	98·8	100	76
4 ,, ...	100	20	98·4	90	80
Grade 1	96	18	98·6	80	78
,, 2	78	16	98·4	76	76
,, 3	86	20	98·6	88	76
,, 4	84	18	98·2	80	76

Unreliability of Tests.

Rarely the results suggested improvement, although the disease was progressing (Table VII.).

TABLE VII.

Tests.	I.P.	R.	T.	P. in 5 mins.	P. in 30 mins.
Walking A.M. and P.M.—					
2 miles	104	20	96	100	98
4 ,, ...	100	24	96·8	96	88
Grade 3	86	20	97	80	80

A patient who was fit and had no evidence of pulmonary tuberculosis gave the result shown in Table VIII.

TABLE VIII.

Tests.	I.P.	R.	T.	P. in 5 mins.	P. in 30 mins.	Resting pulse.
1 mile walking A.M. and P.M.	110	20	97	100	92	70
Grade 2	106	20	98	98	90	70

A patient with slight disease but no toxæmia showed a tachycardia due to excitement. Repeated tests usually overcome this difficulty, but sometimes the tests have to be abandoned (Table IX.).

TABLE IX.

Tests.	I.P.	R.	T.	P. in 5 mins.	P. in 30 mins.
1 mile walking A.M. and P.M.	156	24	97	138	124
Grade 2	130	18	98	128	120

These are gross examples of unreliability in the results. Slighter degrees of unreliability are fairly frequent and have to be watched for. People accustomed to doing heavy work will usually do better exercise tests than sedentary workers. The age of the patient is important. In hot weather and high winds tests are less reliable.

Artificial Pneumothorax Cases.

The same general principles apply. A patient with a completely collapsed lung can produce excellent tests, but the mechanical factor gains prominence in pneumothorax cases, and then tests are very helpful. For example, where heart and mediastinal displacement have occurred a good result proves that any mechanical difficulty has been overcome. Again, where the character of an exercise test suggests that a mechanical factor is at work a reduction of pressure to correct the mediastinal displacement can be tried.

In the hands of those accustomed to using them these exercise tests have been of great help in controlling the treatment of patients under sanatorium conditions. We hope that this paper has sufficiently indicated their usefulness to interest others who have not yet given them a trial.

THE INCIDENCE OF TRAUMATIC EPILEPSY AFTER GUNSHOT WOUND OF THE HEAD.*

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THERE seems to be extremely little information on the type of case which develops traumatic epilepsy and the frequency of incidence, and it is with the object of clearing up these points that this paper is written. The following are the only references that I have been able to find which deal at all with the statistics of the problem. P. Sargent[1] states that up to the end of the year 1920 the Ministry of Pensions had traced 18,000 cases of gunshot wound of the head, of whom nearly 800 (or 4½ per cent.) were subject to epileptic fits. Bathe Rawling[2] traced 425 cases of gunshot wound of the head by circularising. Of these, approximately 25 per cent. report that they are suffering from fits, but their statements are unsupported by any examination. W. Aldren Turner[3] quotes Allen's statement of the frequency of onset of traumatic epilepsy after the Franco-Prussian war, when 571 cases of gunshot wound of the head were reported with 25 cases of traumatic epilepsy. An extensive search of the French, German, and American literature has failed to bring to light any other statistical statement. G. Voss[4] refers to a series of his cases, 34 per cent. of whom developed epilepsy, but the cases which came under his care were specially selected as mentally unstable cases of gunshot wound of the head.

The cases in this series came under my care in France during the years 1916–1918. During the greater part of that time a special hospital was open at St. Omer for treatment of cases of gunshot wound of the head from the First Army area. These cases were sent direct to the hospital from the casualty clearing stations for the most part without operation, and were operated on by me at No. 7 General Hospital. I have full notes of their conditions. A certain number of cases are also included upon whom I operated in casualty clearing stations during 1918.

The total number of cases is 820. Of those traced there were alive, 340; dead, 245=585. Of the 245 dead, 208 died in France within two months of being wounded. The majority of cases were kept in hospital in France under my observation for two months or less, and a few cases longer, until their condition was regarded as completely stable.

The cases considered here have been followed up by examination of the Ministry of Pensions records. They have been brought up to date in the course of the last year, and represent a history of the patients' careers up to 11 years from the time at which they were wounded. It is thought that this series of representative unselected cases of gunshot wound of the head, which includes the majority of cases from the First Army area over the period it covers, may give a valuable indication of the frequency of onset of certain types of epilepsy in this class of case. Investigation is, of course, limited by the fact that it has been impossible to interview these patients personally, and the particulars of complications vary enormously in the different reports.

Analysis of the Series.

In analysing the series we are especially considering the 340 cases who are still alive and the 37 who died after their return to England, for it is obvious that the cases who died shortly after being wounded are irrelevant.

The total number of cases who show definite traumatic epilepsy, as established to the satisfaction of the Ministry of Pensions, is as follows: Alive, 31; dead, 6=37. In addition to these, there were 23 alive and 5 dead, who complained of fits, but since the medical boards did not establish them as true traumatic epilepsy they have, therefore, been omitted.

The following table gives the number and type of the cases traced who are still alive, and the number of cases of traumatic epilepsy classified according to the type of gunshot wound of the head:—

—	Traced.	Fits.
Penetrating dura.		
Alive	155	28
Dead	21 (13·5%)	5 (17·8%)
Total	176	33 (18·7%)
Fractured skull: dura not penetrated.		
Alive	117	2
Dead	7	—
Total	124	2
Scalp wound only.		
Alive	56	1
Dead	4	1
Total	60	2
Concussion and fractured base: no wound of head.		
Alive	12	—
Dead	5	—
Total	17	—
	377	37 (9·8%)

The vast majority of cases of traumatic epilepsy are, therefore, cases in which there have been penetrating wounds of the head, and the percentage of traumatic epilepsy in these is as high as 18. In all the rest the incidence is only 2 per cent., and the incidence in the whole series is just under 10 per cent. It is justifiable to conclude that the incidence of traumatic epilepsy is definitely associated with the severity of the primary wound.

Other Factors Controlling the Incidence of Traumatic Epilepsy.

Situation.—In this series there were (penetrating):

Frontal	10 (5 dead)	Temporal	2
Parietal	10	Occipital-parietal ..	4
Fronto-parietal ..	4	Occipital	3

Four non-penetrating wounds: 3 parietal; 1 temporal (dead).

The wounds are fairly evenly distributed all over the scalp, except that there is rather a preponderance of parietal wounds.

Severity of Complications.—All the five cases of injury in the frontal region which are still alive show marked mental deterioration. Most of the cases of parietal injury, and the three cases of occipital injury, show marked organic lesions. In the latter a foreign body has traversed the greater part of the cerebrum and is lying in the frontal region, causing a marked paralytic lesion.

So that of the 28 cases which are alive, 21 have severe complications. Of 155 cases of penetrating wounds 59 show severe organic complications, while 96 show no severe complications. Of the 59 with organic complications, 16 (27 per cent.) have fits. Of the 96 with no organic complications 12—i.e., 12·5 per cent.—have fits. It is obvious, therefore, that fits are more common in cases which have severe organic lesions.

Time of Onset of Fits.—In many cases the patients had complained of fits for some years before these were definitely established and certified by a doctor and accepted by the medical board. One must take

* A paper read before the Society of British Neurological Surgeons at their meeting in Edinburgh, June, 1928.

[1] Brain, 1921, xliv., 312.
[2] Brit. Jour. Surg., 1922–23, x., 93.
[3] Jour. Neur. and Psychopath., 1923, iii., 309.
[4] Münch. med. Woch., 1921, lxviii., 258.

it that the original complaints were quite genuine. In many cases there is a definite history that the attacks increase in severity as time goes on. The time of onset of the fits is therefore taken as the time of the first complaint. The earliest was approximately two months from the time of injury, and the latest was seven and a half years, the average being two years and one month. This observation is interesting in view of the fact that traumatic epilepsy is generally believed to develop within a few months of the injury. Many cases are well known in which the time of onset of the epilepsy has been even more than seven and a half years from the time of wounding.

Association with Early Fits.—It has been usually stated that early fits are of no importance in the prognosis of traumatic epilepsy, but among the 37 cases of traumatic epilepsy five had had fits in the early stages—that is to say, within a few days of the onset. These early fits are of the true Jacksonian type and soon disappear, and the patient is entirely clear of fits for a period of years or months. Among the cases that we have traced so far only seven others had early fits which gives a very high percentage—approximately 13·5—of early fits in cases of traumatic epilepsy and approximately 2 per cent. in the rest. The number of early fits observed in the cases traced (12) is too small for definite conclusions to be drawn, but it is suggestive.

Association with Foreign Body in Brain.—Of the 33 cases of penetrating wounds of the head which developed fits, 12, or 36 per cent., showed a foreign body in the brain. Of the remaining 143 cases traced up to date, 35 (25 per cent.) showed a foreign body in the brain. These figures again bear out the general conclusion that the more severe wound is more likely to cause fits.

Mortality.—The onset of fits has no marked effect on the mortality. Of the 37 cases with fits six have died. Five had penetrating wounds and one a scalp wound. The latter died of status epilepticus two months after being wounded. One of the former died of influenza two and a half years after being wounded; two died as a result of fits, one of meningitis, and one committed suicide. Six deaths in 37 cases gives a mortality of 16·2 per cent., whereas all the cases of gunshot wound of the head traced up to date—377 in all—show 37 deaths after returning to England—i.e., over the same period as the traumatic epilepsy patients—a mortality of 9·8 per cent. There is not sufficient difference in the mortality to justify any conclusions.

Conclusions.

Taking the series as a whole, we must divide the cases of traumatic epilepsy into two classes: (1) cases of slight injury—i.e., scalp wounds and non-penetrating fractures; (2) cases of severe injury with gross cerebral destruction and laceration.

I am inclined to think that the cases with scalp wounds would in all probability have developed epilepsy apart from any organic injury to the head. Both scalp wound cases which developed epilepsy did so very soon after the wound, and I cannot help thinking that they come under a different category from those of gross destruction. Undoubtedly the most common cause of traumatic epilepsy is a severe destruction of the brain substance which is, of course, always associated with sepsis; presumably this is a factor in the production of epilepsy.

The definite facts brought out by this investigation are:—

1. Traumatic epilepsy is nearly ten times more common with penetrating wounds of the dura than with other injuries to the head.

2. The site of the wound has no influence on the onset of traumatic epilepsy.

3. Traumatic epilepsy is more than twice as common in cases of penetrating wounds of the dura which show severe organic lesions than in those which do not.

4. Traumatic epilepsy may come on at almost any time after a gunshot wound of the head. In this series the variation is from two months to seven and a half years.

5. Traumatic epilepsy appears to be much more common in those cases which show transient Jacksonian fits within a few days of the injury.

6. Traumatic epilepsy is somewhat more common in those cases where a metallic fragment remains in the brain.

7. The mortality in cases which have developed traumatic epilepsy is rather higher than in other cases of gunshot wounds of the head.

In conclusion, I would like to express my gratitude to Sir Cuthbert Wallace for his assistance and encouragement throughout the whole course of this investigation; to Sir Walter Morley Fletcher for allowing me all the facilities at the disposal of the Medical Research Council in order to trace these cases; and to the many officials of the Ministry of Pensions who have so courteously provided me with the materials for this research.

Clinical and Laboratory Notes.

A CASE OF TRUE DIABETES MELLITUS COMPLICATED BY PREGNANCY.

BY N. M. GOODMAN, M.B. CAMB.

THE striking alteration in prognosis since the introduction of insulin therapy is well illustrated in the following account of a rare complication of true diabetes—viz., pregnancy.

An unmarried domestic servant, aged 26, was first seen on Oct. 24th, 1927. She complained of great thirst, beginning four weeks previously, and also of lassitude and wasting. The urine was found to be loaded with sugar; acetone was also present. On Oct. 28th she was admitted to the Lymington Cottage Hospital and put on Allen's diet. Her weight on admission was 6 st. 13 lb. After three days on a fat-free diet, 48 hours' starvation was required to render the urine sugar-free. She remained three weeks in hospital, during which time she gained 7 lb.

She was sent out on a diet representing 25 calories per kilogramme of body-weight—i.e., 7 lines (omitting bread) on the line ration scheme (R. D. Lawrence). Any increase resulted in sugar appearing in the urine. While in hospital she was taught how to do her own Fehling's tests. Insulin treatment was refused. After discharge she probably exceeded the diet, and though her weight and general condition remained stationary, sugar was constantly present in the urine in varying amounts.

In February, 1928, her relatives discovered, and she admitted, that she was pregnant. The last period ended on Oct. 21st, but she had lost blood in what was taken to be a normal period while in hospital. Conception had presumably taken place just before her admission. On examination she was found to be four months pregnant.

Insulin was now insisted upon, and the patient was taught to administer it herself, at first under the supervision of the district nurse. As she lived quite out of reach of immediate medical assistance, insulin dosage was not pushed rapidly up. She began on 7 units twice daily, and the diet was increased to give 35 calories per kilogramme of body-weight. Dosage was gradually increased, but it was not until seven weeks had passed that the urine was consistently sugar-free, the dose being then 25 units twice daily. Pregnancy was wholly uneventful, and on June 25th she was readmitted to the Cottage Hospital. On June 28th Cæsarean section under spinal anæsthesia was successfully performed by my partner, Mr. R. M. de Mowbray, and the mother was sterilised by resection of a portion of the Fallopian tubes. A healthy boy weighing 8¼ lb. was delivered. No change in the diet or insulin dosage was made before, during, or after operation, nor was extra carbohydrate given.

On June 30th (two days after operation) some signs of hypoglycæmia (faintness and rapid pulse-rate) appeared, and insulin was reduced to 20 units twice

daily.[1] This was found to be insufficient to keep the urine sugar-free, so on July 6th the dose was raised to 23 units. The puerperium was uneventful, and mother and child are now quite flourishing. Since discharge she has exceeded her diet and gives herself 25 units twice daily to correct it; on this dose the urine is usually sugar-free.

A point worthy of note was the entire absence of "alarums and excursions," although she was a not too intelligent patient, living four miles from medical assistance, and also in spite of the impossibility of control by blood-sugar estimations, which were entirely omitted.

A CASE OF TRAUMATIC RUPTURE OF THE SPLEEN IN AN ELDERLY MAN.

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THE following case of traumatic rupture of the spleen in a man aged 61 appears to be of interest.

The man was admitted to the Royal Infirmary, Sunderland, at 5.30 P.M. on July 23rd, 1928, complaining of injuries sustained on being thrown against a wall by a cow at 9.30 A.M. on the same day. He complained of pain on the left side of the thorax and down the left side of his abdomen to the iliac crest. Fracture of the eight and ninth ribs was diagnosed and treated. The abdomen showed no bruising, no distension, and there were no signs of any internal injury. There was no free fluid. He passed normal urine without difficulty, and his general condition was good until 10.30 P.M., when the pulse-rate began to rise and at the end of an hour was 120. His respirations had become deepened, but not definitely sighing. He was blanched and restless. He complained of diffuse pain and tenderness in the left side of his abdomen, most marked over the splenic area, and there was now dullness in both flanks, extending medially to the mid-clavicular line.

The provisional diagnosis of ruptured spleen was made, and at 12 P.M. Dr. G. S. Robinson, assistant honorary surgeon, made a small exploratory mid-line incision in the upper abdomen; free blood gushed out. A second incision was then made from the mid-line in front, parallel with the left costal margin, as far as the anterior axillary line. On palpation the spleen was felt to be twice its normal size and fluctuation was detected on the costal surface. After draining off the free blood the spleen was drawn into the wound as far as possible. The capsule was seen to be lifted off the organ and ruptured anteriorly. Splenectomy was performed, the pedicle being held between the index and middle finger of the left hand, exposing a small tear in the organ near the hilum anteriorly. No. 3 chromic catgut was used to ligate the pedicle and the abdomen was closed in layers. The patient was sent back to the ward somewhat collapsed. Rectal salines and hypodermic injections of pituitary, ½ c.cm., were given four-hourly and next morning the collapse had passed.

The spleen was found to have two injuries; a small tear near the hilum anteriorly and a rupture in the organ itself on the costal surface above the notch. The blood had stripped the capsule off the organ for a considerable extent, but had not clotted.

Recovery was rapid. Three days after operation the temperature rose to 100° and there was pain at the site of fracture of the ribs. Firm strapping relieved the pain and the temperature fell to normal. The wound healed by first intention. A blood examination taken on August 15th, 1928, gave the following figures: hæmoglobin, 80 per cent.; red blood cells, 4,630,000 per c.mm.; white blood cells, 18,200 per c.mm.; colour-index, 0·87. *Differential white cell count:* polymorphonuclears, 62 per cent.; eosinophils, 1 per cent.; lymphocytes, 25 per cent.; basophils, 0; large mononuclears, 12 per cent.

The mechanism of the injury must have been as follows: The man fell on his left side and fractured his ribs, at the same time crushing the spleen and causing rupture of the organ under the capsule. Hæmorrhage took place between the organ and capsule until the tension overcame the resistance which the capsule offered, the rupturing of the capsule and the consequent hæmorrhage giving rise to the sudden collapse and signs of free fluid.

[1] See C. G. Lamble: THE LANCET, 1927, i., 22.

Medical Societies.

MEDICAL SOCIETY OF LONDON.

AT a meeting of this Society held on Oct. 22nd the chair was taken by Dr. WALTER CARR, and a discussion on the

DIAGNOSIS AND TREATMENT OF EMPYEMA

was opened by Dr. C. E. LAKIN, who distinguished a synpneumonic type occurring simultaneously with pneumonia consolidation and a much commoner metapneumonic type—arising as a sequel of the pneumonic process. The former was almost confined to children under two and was revealed by grave illness, dyspnœa, high fever, cyanosis, and flat percussion note at the base with ægophony or skodaic resonance over the upper part of the lung and heterolateral displacement of the apex beat. In all kinds of empyema loud tubular breathing might be heard. Metapneumonic empyema might go unrecognised when the mother gave no clear history of pneumonia and the child lost weight, refused food, became very pale, and sweated profusely. There might be little fever or dyspnœa, and the child might die before the cause of the toxæmia was discovered. Even a leucocytosis might be absent and only examination of the chest reveal the trouble.

The commonest organism next to the pneumococcus was the streptococcus, which was a more serious invader because the effusion it produced was poor in fibrin, and so adhesions did not form to limit the spread of pus. It was highly important to distinguish a diffuse from a circumscribed empyema, for opening the former might be disastrous. X ray examination might be misleading, although lateral projection and the Potter-Bucky diaphragm had improved the results. Where it failed, estimation of the pleural tension was helpful. Localised empyemata were classified according to position into: (1) encysted empyemata of the general pleural cavity, lying between the costal and visceral pleura; (2) basal, between the base of the lung and the diaphragm; (3) apical; (4) interlobar; and (5) mediastinal, between the mesial aspect of the lung and the mediastinum.

Physical Signs.

Local œdema over the chest was almost pathognomonic of empyema, but was not often seen. Tenderness on deep pressure suggested a purulent effusion, and friction was not often heard above the level of an established purulent effusion. About 10 ounces of fluid were required to displace the heart appreciably, unless the smaller quantity lay between the lung and the mediastinum. A history of intermittent temperature, setting in after the crisis of a pneumonia had passed, was very suggestive, but high fever, chills, and sweats might occur in serous effusions. In puzzling cases radiography should precede the use of an exploratory needle, which was the final test. All the recognised signs of pleural effusion might occur in other conditions; suppuration within or below the lung was most likely to cause difficulty in diagnosis.

Treatment.

The post-war epidemic of influenza had shown how bad were the results of immediate evacuation and drainage of the pleura. The substitution of aspiration for thoracotomy had immediately improved the mortality-rate. Irrigation might cause sudden death or convulsions. Early diagnosis was essential, and must be based on a correlation of the physical signs, radiological examination, and bacteriological findings. Offensive puncture fluid usually meant the presence of a long thin saprophytic bacillus from the respiratory or alimentary tract, betraying some communication between the pleura and the lung or abdominal viscera. For these cases immediate drainage was essential. When the fluid was non-offensive but

purulent the treatment depended on the condition of the lung. If active pneumonia was in progress thoracotomy would be catastrophic, and dyspnœa should be relieved by daily aspiration and careful nursing until the pulmonary lesions retrogressed. Delay was rarely necessary for more than a few days, so that the risk of permanent harm from fibrosis was small. When operation was possible, local anæsthesia was preferable, as it caused less shock and pulmonary irritation. To encourage approximation of the walls of the empyema cavity the patient should get up as soon as possible and should sit up during the day, and respiratory exercises and a Woulfe's bottle should be instituted early.

Mr. TUDOR EDWARDS, dealing with the

Surgical Aspect of Empyema,

said that the term empyema should be limited to the localised type, using the word "pyothorax" for the generalised form. Radiography was a most valuable aid to diagnosis, and should never be neglected. It enabled one to visualise the intrathoracic conditions and drain at the best site. Sometimes X rays did not distinguish between thickened pleura and empyema. Normally peripheral empyema showed a dense shadow towards the lung, extending upwards to the axilla; in the apical type the shadow was more globular and well defined, rarely showing displacement of the mediastinal structures. True interlobar empyema was distinctive; a broad band of opacity marked out the interlobar fissure. Diaphragmatic empyemata showed an increase upwards of the liver shadow on the right side, while mediastinal empyema generally appeared as a broadening of the mediastinal shadow with displacement of the heart or great vessels. Exploration with needle and syringe was the most important diagnostic aid, but precautions were necessary. It should always be done under local anæsthesia to avoid pleural shock. Neoplasms occasionally simulated empyema, but a large polymorphonuclear leucocytosis indicated the latter.

Treatment must never be an emergency. Rib resection under local anæsthesia should be performed as soon as sufficient adhesion was present; this was usually indicated by thick pus. The wound should be repacked with gauze every three days; the granulation tissue which formed prevented extension of infection. If the wound had not healed in six weeks tuberculosis or neoplasm should be suspected. Fatalities from irrigation were due to using a small tube in a small cavity, producing sudden increase in pressure. The chlorine group were the disinfectants of choice for decorticating agents. Bad results of operation were chiefly due to late diagnosis or inadequate treatment. Interlobar empyemata called for much the same treatment as pulmonary abscess. They might be drained in one stage when they were near enough to the surface to produce adhesions. Some tuberculous empyemata would clear up with aspiration and gas replacement; they should never be drained unless secondary pyogenic infection was spreading.

Chronic empyema might result from delayed diagnosis. These collections of pus might drain into the lung so slowly that patients were not laid up. Clubbing of the fingers was always marked, but the only means of distinguishing between thickened pleura with and without empyema was aspiration. Lipiodol was useful in diagnosis; it should always be injected through the smallest catheter possible.

Dr. F. J. POYNTON described research on empyema in children at Great Ormond-street. The mortality in infancy had been 76 per cent. one year and 55 the next, due mainly to shock and septic poisoning from open incision and drainage, while the dressings inflicted great suffering on nervous children. Out of 22 cases treated by the apparatus for continuous aspiration six had died, one of glioma of the brain and another from a safety-pin impacted in the bronchus; two from meningococcal meningitis, and one of septicæmia. Aspiration had failed completely in three cases in which late resection had been performed. On the other hand, children had been snatched from the grave by this method. The great ideal was to keep the cavity free from secondary infection, but it was difficult to prevent pus oozing round the edge of the cannula and the tube becoming displaced. It was essential to learn more about the physical signs until a slowly expanding lung could be distinguished with certainty from residual pus. Children should be sent into the country after early drainage to ensure rapid expansion.

The Importance of Physical Signs.

Dr. W. BROADBENT said diagnosis should be by physical signs before recourse to X rays. He cited several cases in his own practice and described the physical signs obtained from them. An interlobar empyema was often betrayed by a band of dullness in the second and third intercostal spaces in front or just below the spine of the scapula behind. If there was much pus the lower lobe might be so compressed that it was silent, causing a mistaken diagnosis of ordinary empyema. Unfortunately, physical signs differed in every case. The best place for a needle was in the upper axilla, with the arm at right angles to the chest. A very rare position for pus was between the mediastinum and the lung, the lower lobe being held to the chest wall. In old interlobar cases the lung should be stitched to the pleural opening unless the pleura was adherent. In ordinary empyema operation should be performed the day after pus had been withdrawn by aspiration; this lessened shock and gave the pleura a chance to become adherent.

Sir CHARTERS SYMONDS had had good results from irrigation, but the fluid should return immediately. Because replacement of the tube was difficult and painful, there was a tendency to slip a small one in, but if two tubes were used alternately there was no pain and no trouble. The size of the tube should bear some proportion to the size of the cavity. In old cases a metal tube was the best. A wire tube was useful, because granulations got between the interstices and held it in. It need not be removed until the cavity had shrunk to the same dimensions as the tube. He doubted if secondary infection could be prevented except by abundant application of cyanide gauze and a sheet of jaconet.

Dr. G. STEBBING discussed the conclusions arrived at from 158 cases. In none of them had resection been undertaken until the fluid was very purulent. When the pus was not localised they had been treated by frequent aspiration. The first conclusion was the value of operating as soon as the fluid was localised. There was a direct relation between the time allowed after localisation and the time taken in healing. Few of these wounds had lasted for three weeks, and many had healed within ten days. Secondly, radioscopic examination before operation was of great value. The tube inserted must be long, because often the diaphragm came up against the chest wall and shut the end of the tube up. The tube must be kept in. X rays were useful for checking the progress of treatment and for revealing pools of pus left undrained. Antiseptic drainage was too frequently neglected; the fluid was always infected and decomposition would go on until it was prevented. Suction drainage had not been successful; it made the patient very uncomfortable and had no advantage. Old discharging empyemata should be freely opened after the size of the cavity had been estimated by X rays. If the cavity was no smaller after three to five weeks some form of chest collapsing operation should be performed.

Dr. SEYMOUR BARLING emphasised the value of local anæsthesia. He had used Dr. Poynton's apparatus with success for infants, but for bigger children he preferred closed drainage. The sooner the tube was out the better in resection cases, provided care was taken to prevent the cavity closing too soon. Children were generally kept in bed much too long;

they needed country air and exercise. For the adult, golf was the best means of securing closure of the cavity.

Dr. G. MARSHALL described bad after-results in two cases. On theoretical grounds he strongly favoured negative pressure drainage. Every year he saw a few cases of amyloid disease due to small loculated collections of pus being left behind, and this was indeed the commonest cause of amyloid disease to-day.

Dr. LAKIN and Mr. TUDOR EDWARDS replied.

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS.

ANNUAL CONFERENCE IN LONDON.

(Concluded from p. 819.)

THE Conference resumed on Oct. 16th under the chairmanship of Sir ARTHUR STANLEY, to discuss

The Principles Underlying a Scheme of Anti-tuberculosis Measures in any Country.

Sir ROBERT PHILIP said that the principles forming the basis of an effective antituberculosis campaign were simple, straightforward, and closely linked, yet the practical significance of scientific advance was still far from being adequately appreciated. A century ago, Boyle and Laënnec—both ultimately victims—had established the morphological unity of tuberculosis in all its varying expression. Its essentially infective character had been established by Villemin (1865) and Koch (1882). Those who had lived through the pre-bacillary and bacillary periods understood the revolution which had taken place. The almost universal distribution of tuberculosis had shown that the problem must be attacked by measures applicable to every member of the community. The ordinary citizen had to be educated on the nature of infection and means of control; a properly manned, suitably equipped, and readily available centre was essential for this, and its channels of effective activity were endless. Its supreme value lay in the incessant promulgation of the principles of healthy living. The far-reaching issues of the economic and occupational disturbance created by tuberculosis in a wage-earner called for an efficient care committee in connexion with every tuberculosis centre.

The infant was seldom, if ever, born tuberculous; infection was contracted in childhood and the child was generally tuberculised before puberty. Therefore preventive methods must be directed towards the infant, and the family doctor had important responsibility. In childhood the advent of infection could be determined almost to the moment. Once infected, the individual often remained under the influence of infection all his days, and effects might emerge at any time with extraordinarily varied manifestations and degrees of gravity. If early infection were more precisely interpreted and followed by satisfactory preventive measures gross disfigurements and crippling would disappear. The supreme efficiency of physiological hygienic environment in raising individual resistance had been proved, yet the lesson of the sanatorium had been inadequately applied in the preventive sphere. If the tuberculosis officer and family doctor were insistent on the re-creation of the home, and especially the nursery, on sanatorium lines, the danger in consequence of infection in childhood would be reduced to a minimum. Far better to run all schools on physiological lines than to erect special schools here and there for pronounced sufferers. The crying claim of the cells of the growing child was for greater and easier oxidation. Serviceable as medical and surgical treatment might be, the ultimate purpose before the Association was the eradication of tuberculosis. Whatever might emerge from present attempts at immunisation, the trend of scientific advance during the past 30 years clearly indicated that present policy lay along the lines of enlightening the public and training the doctor. Along these lines the need for curative institutions might be expected to disappear in a generation or so. The mortality from tuberculosis in London had decreased 45 per cent. in a quarter of a century, and an even greater drop had been recorded in New York.

A Canadian Organisation.

Dr. J. H. HOLBROOK (Medical Director of the Hamilton Health Association and the Mountain Sanatorium, Canada) described the fight against tuberculosis in Hamilton. The one original idea to which his Association laid claim was that of abandoning the despatch of patients to distant places for change of climate. It had been much easier to persuade patients to enter a local sanatorium, and this had paved the way for educational developments among the citizens. The mortality-rate for 1905, when the sanatorium had been established, was 126 per 100,000; for last year it was 49·5 per 100,000. The first factor in this excellent result was the whole-hearted support of the leading citizens and the people. A unit of about 100,000 inhabitants was easier to organise for public health work than a larger or a smaller one, and a third factor was that financial assistance from the city authorities had always been forthcoming. Thus it had been easy to remove open cases from the city to the sanatorium, and the spread of infection had been proportionally reduced. Home treatment had been found unsatisfactory, and patients were allowed to remain in the sanatorium as long as treatment was indicated. The visit of Sir Robert Philip in 1908 had inaugurated a clinic or clearing-house, as in Edinburgh. The clinic work had now been taken over by the department of health of the city, but the sanatorium still supplied the medical examiners, as well as placing itself at the service of general practitioners throughout the district. Closest coöperation was maintained between the antituberculosis association and the medical profession. Whilst seeking cases at an early stage, the Association had traced so many children that a "Preventorium" and outdoor school had been erected in 1909, and had grown until now there was accommodation for 80 children. The specialised diagnostic work of the clinic had proved very valuable to the military authorities during the war, and the sanatorium had received many tuberculous soldiers—about 3500 in all. From this new experience had arisen an appreciation of the value of occupational therapy and a new conception of psychotherapy in the treatment of tuberculosis. Economy had been relaxed for returned soldiers, and the equipment of the sanatorium had been enriched by an X ray plant, a dental department, and better laboratories. Consequently the number of civilian patients had been increased to about 500 in order to make the place an economic institution. These patients had all the benefits of the enlarged sanatorium at a fee of $1.50 per day, paid by the municipality for poor persons. Thus the sanatorium had become a provincial instead of a local one, a step which had also been rendered necessary by increasing facility of communications between the city community and the surrounding country. After-care had been given much thought, and the only feasible plan had been education of patients in the sanatorium during their long period of convalescence. A complete radio equipment had been most helpful in combating the feeling of being shut off from the world, and as a medium of regular lectures and courses of instruction. The conclusion had been reached that the younger patients were suffering from a lack of broad educational training. Appeals to various welfare organisations had resulted in the establishment of a scheme of education which included wireless lectures, library education, vocational training, and many handicraft activities. Teachers coached patients for their matriculation in English, French, Latin, and mathematics. A commercial course, including typewriting, stenography, and commercial art was also provided. The result had been a new outlook of hopefulness, which had revolutionised the institution.

The Importance of a First-class Tuberculosis Service.

Dr. G. LISSANT COX (Chief Tuberculosis Officer, Lancashire County Council) enunciated the principles of antituberculosis measures as the application of preventive public health or social measures and the accurate diagnosis and treatment of the individual patient. These platitudes, he said, brought out the important factor that we must drive two horses, and drive them tandem, the leading horse being Prevention. The three chief measures were the dispensary unit, including notification, the institutional unit, and after-care and education. The dispensary must be an organisation and not a building, and the commanding officer was the most important part of the whole thing. This was of vital importance. If the officer were incompetent because badly paid, if he were not provided with adequate means to be a real up-to-date specialist, if a real specialist could not be employed, then the money spent on any local scheme was mostly wasted. The officer should in all cases be whole-time at a pre-war salary of £400–£500. At the present day there were nearly as many part-time as whole-time officers, and few received this salary. The reasons for this were that many did not believe in whole-time tuberculosis work, thinking it was too expensive or too dull, and that the large number of small county and county borough authorities made it impossible for each to have a whole-time officer. The tendency to hand over the dispensary unit to the local sanitary authorities would mean a lowering of the standard of tuberculosis work and a divorce between the dispensary side and the institutional side of the work; it was most important that the tuberculosis officer should have beds at his disposal. The suggested remedy—appointment of consultant tuberculosis officers—merely provided three doctors instead of two to deal with one patient—the family doctor, the omnibus medical officer of health, and the consultant. The dispensary area should be not less than 250,000 population or the standard of work could not be maintained. Notification was necessary for any complete scheme, but was not as perfect as it should be. Notification should obtain not only all the cases, but the early stages. What was urgently required was a Framingham experiment in England—i.e., a house-to-house search for cases of tuberculosis. The cure for attendance too late at a centre was better education and teaching of hygiene, but periodic health examinations alone would reveal all early cases. The Astor Report had recommended one sanatorium bed and one hospital bed for 5000 population, and Lancashire had found this substantially correct. For children, one pulmonary bed per 24,000 and one non-pulmonary bed per 10,000 population were necessary. The three settlements that had been started were under private management. The scheme was not practicable under public administration, and 75 per cent. of cases were unsuitable for settlement life as organised at present. Moreover, multiplication of settlements would produce overcrowding of the market for the goods manufactured. There must be adequate accommodation in the institution for the isolation and nursing of advanced cases, and there was often too little of this. On the other hand, there should not be many such cases in any one institution, nor should patients be taken far from their homes. In Lancashire the problem had been attacked by providing in each dispensary area a hospital, run by the consultant tuberculosis officer and his assistants. This was cheap, allowed the superintendent to know the home conditions of his patients, and gave the tuberculosis officer charge of beds. The dispensary and hospital unit should not be divorced or under separate management. The success or failure of institutions depended largely on their size; none should have more than 150 beds. After-care committees were very valuable. The tuberculosis service must not get disheartened and must not run after every panacea. Given the means, it could and would conquer this terrible scourge.

Dr. JOURDRAN described the great effort made during the last three years to protect the people of Indo-China by "B.C.G." Over 50,000 vaccinations had been registered. 850 infants under Dr. Jourdran himself at the Maternity Hospital at Tonkin had been vaccinated during their first week of life, without a single accident. He spoke of the dark, crowded rooms in which these people lived, but believed that it was possible to educate them. A great debt of gratitude was owing, he said, to Government, Red Cross, and welfare work to improve the conditions of life, and also to the public health service of the League of Nations, which was a powerful help.

Mr. Councillor ORR (Derby), expressing a layman's point of view, said that health authorities should direct their attention to the young. New housing settlements were important factors in the fight, and fresh air, sunshine, and access to open country should be available. He pleaded for support for the National Playing Fields Association, and thought more advantage might be taken of the British Rotary movement.

Mr. H. D. LEVICK (Middlesbrough) quoted the saying that we cultivated more tuberculosis in our insanitary areas in one week than all our sanatoria could house in a year, and looked to the slums for the answer to the question why the final results of sanatorium treatment were not as good as had been hoped. The patient returned from the institution with a poor earning capacity and had therefore to live in a poor environment, so that the vicious circle of tuberculosis and poverty was established. The tuberculosis officer of Middlesbrough had taken a census two years ago, visiting 1159 homes of patients on the dispensary register. The majority were overcrowded two-, three- or four-roomed houses in a smoky industrial area. In 251 houses there were from two to seven families in residence, and three houses had more than seven. In 320 of these dwellings there were from one to seven lodgers; in 68 of them there were more than four to a bedroom. 486 tuberculous people were found sharing beds with healthy relatives. The incidence of the disease in the industrial ward was 6·19 per 1000; in a residential ward 2·16 per 1000, but in the garden colony it was only 1·6 per 1000. He urged the enthusiastic support of garden colonies, and thought the Ministry of Health should give financial encouragement to local authorities for garden colonies, permanent sanatoria for families, and preventoria for wives and children on the sanatorium estate.

The Rt. Hon. H. J. TENNANT (Treasurer) assured the meeting that the officers of the Association were most anxious to use the large sum of money now at their disposal in the prevention rather than in the cure of tuberculosis.

Sir JOHN ROBERTSON (Birmingham) said that nothing was more needed than a properly balanced statement such as that made by Sir Robert Philip. The layman was too apt to think of sanatoria, dispensaries, and medical officers, whereas tuberculosis was a biological problem to be dealt with biologically. It would be better to estimate tuberculosis by the number of new cases every year rather than by the deaths. He suggested an intimate investigation of the way of living of those who escaped tuberculosis, as well as of those who succumbed.

Dr. F. L. MORGAN (County Tuberculosis Officer, Northumberland County Council) pleaded for some practical scheme in the absence of funds adequate to the needs of a district. It was impossible to educate people who had insufficient food and were striving to keep a family of 13 or 14 when they could only afford three. The more money spent on "schemes" the higher the rates went, still further crippling trade and increasing poverty.

Councillor BROWN (Shoreditch) urged an attack on the housing problem, saying that sanitary inspectors were handicapped by having nowhere to put tuberculous families found in crowded houses. The Becontree scheme was failing because it was too expensive; a man with £2 10*s.* a week wages could not keep a family of three or four and pay 15*s.* or £1 rent, and then 8*s.* or 9*s.* fares to work. The Government

should be pressed to arrange free or reduced travel for workmen under a certain wage-scale. The "million houses" erected had all been for the middle classes, and so far nothing had been done for the really poor.

Sir ROBERT PHILIP, summarising the discussion, said that most of the stress had been laid on prevention. The Framingham experiment did not need repeating; it was complete, having proved that there were far more cases of tuberculosis in an area than were recognised by present methods. He warned the association that efforts must go along natural lines, and that Nature would not be hurried or fussed.

Dr. J. H. ELLIOTT (President, Canadian Tuberculosis Association) urged the importance of genuine preventive methods, comparable with the purification of water and food-supply in the prevention of typhoid. Treatment was important, but it was not the programme of that Association. Many methods had been mentioned, and all were valuable, but one that had not been referred to was the compulsory pasteurisation of milk. Surgical tuberculosis had practically disappeared from the wards of the Toronto hospitals when that city had made pasteurisation obligatory. Toronto had also found that it was essential to have the school inspection nurse, the public health visitor, the infectious diseases nurse, and the tuberculosis nurse all under one authority.

The CHAIRMAN, to whom a vote of thanks was proposed by the Treasurer, remarked that it was curious how these conferences always came round to the problem of housing in the end.

TUBERCULOSIS ASSOCIATION.

ARTIFICIAL PNEUMOTHORAX.

A MEETING of this Association was held on Oct. 17th under the chairmanship of Sir STCLAIR THOMSON, the President, when a discussion took place on artificial pneumothorax treatment.

Dr. R. R. TRAIL, who opened the discussion, dealt more especially with the difficulties met with in arranging for

Post-sanatorium Treatment for Middle-class Patients.

Such patients were unwilling to take advantage of the voluntary help available at the general hospital, but were also quite unable as private patients to afford the fees of experts. The speaker gave several examples of the difficulties encountered in arranging for refills for some of these patients. Dr. Trail said they had to insist on the fact that the induction of artificial pneumothorax was definitely the province of the physician rather than that of the surgeon. The giving of refills was not so specialised a procedure as was sometimes supposed. He suggested that the various sanatoria should offer facilities to physicians to acquire the technique, to see the refills being given, and to learn the type of case for which the treatment was suitable. Another suggestion made by Dr. Trail was that names should be sent in to him of physicians who were able and willing for a reasonable fee to carry on the treatment for middle-class patients.

In the discussion it was pointed out with regard to the proposed rota of names that an international list of this kind had been issued some time ago by an association formed for the purpose, but that this list was incomplete and inaccurate, at least as far as this country was concerned. Other speakers, while endorsing what had been said as to the difficulty of obtaining refills for ex-sanatorium cases—some patients having to travel 130 to 200 miles to get refills from persons qualified to give it—suggested that sanatorium physicians might be allowed to earn a modest fee by treating private patients.

Dr. PETER EDWARDS, speaking on the

Selection of Cases for Treatment.

said that he paid no attention to X ray findings in deciding as to the suitability or otherwise of a given case, but relied exclusively on the clinical findings. Where the disease was advancing he preferred to induce a pneumothorax too early rather than too late, and this was especially the case since he had begun to use sanocrysin in conjunction with collapse therapy. He thought that perhaps artificial pneumothorax treatment was feared because it was so often forgotten that it could at any time be discontinued with the greatest ease. Indications for its use included repeated small hæmoptyses, and persistent pleurisy without fluid, in which the pain was immediately relieved by the introduction of air. Where fluid was present, gas replacement was the simplest method of treatment. Artificial pneumothorax was the quickest route back to the workshop. The main contra-indications, apart from advanced bilateral or generalised tuberculosis, were emphysema, bronchitis, and asthma. Patients with cardiac disease, even in serious cases, could stand pneumothorax fairly well, as could patients with renal disease. Intestinal tuberculosis was an indication for the treatment rather than a contra-indication unless the disease was very far advanced.

Dr. G. T. HEBERT said that he always had an X ray photograph taken before doing an artificial pneumothorax, but he was not necessarily guided by it. Many cases of bilateral disease responded well to the treatment, as in a striking case of his own, which was briefly cited.

Dr. CLIVE RIVIERE said that, as their experience grew, more and more latitude was given to questions of disease in the other lung. With regard to asthma as a contra-indication, the speaker had had a case of quite marked asthma with tuberculosis of the right lung. The asthma had been present from childhood and had got better, but had later recurred as the pulmonary disease developed. Pneumothorax was induced on the right side; the asthma got better almost at once, and the breathing became easier with the collapse of the lung. Another speaker referred to the psychic effect of this form of treatment, especially in chronic sanatorium cases.

The PRESIDENT drew attention to the fact that laryngeal disease was no contra-indication whatever to the treatment; he himself had had no case that had not benefited by its use.

Duration of Treatment.

Dr. RIVIERE said that in a given case the chief points to be considered were:—

1. How much disease was present in the collapsed lung. With caseation or confluent disease, and especially where cavitation had occurred, the period must necessarily be longer than in other cases. In these days artificial pneumothorax was carried out by many more people and cases tended to drift into different hands, so that it was difficult to be certain what the condition was when the treatment was first instituted. The physician who started the pneumothorax should always, he thought, be the one to decide when it could be left off.

2. The amount of collapse. Where this was complete or nearly complete the period might usually be shorter than in less complete cases. The question of cavity was particularly important—i.e., whether the cavity was closed and whether the sputum still contained tubercle bacilli.

3. Another most important point that had to be considered was how far the lung would be able to re-expand at the end of treatment, or how far it was desirable for this to take place.

4. Yet another point was the condition of the other lung. Naturally, the period of treatment must depend on the spread of disease on the other side.

The tendency at the present time was to give longer periods of collapse than was at first thought desirable. Saugmann thought that five years was a reasonable period for collapse to be kept up; Dr. Riviere agreed with this, although in a very few cases he thought three years might be sufficient. In three or four of his own cases four years of collapse were followed by a period of quiescence, but relapse occurred later, one patient finally dying of pulmonary tuberculosis.

Difficulties of Induction.

Dr. S. VERE PEARSON agreed with Dr. Edwards that too much importance should not be attached to radiological findings, though he also agreed with Dr. Riviere

that they should not be ignored. Under favourable circumstances there was a chance of doing good by a pneumothorax first on one side and then on the other. A difficulty occasionally met with was cardiac oscillation, another being the fact that sometimes when fairly large amounts of gas—900 to 1000 c.cm.—were given the lung did not appear to be appreciably collapsed, and the edge could hardly be seen by the X rays. He suggested that in such cases the patients should be screened in every possible oblique position, by which a good deal of information might be obtained. Adhesions were a great source of difficulty, for very few of them were susceptible to treatment. He thought that it was unnecessary to cauterise even band-like adhesions, if the patient was getting on well in spite of their existence.

Some of the Canadian tuberculosis officers who are visiting England took part in the discussion. One of these drew attention to the value of phrenicotomy as an auxiliary measure, and also pointed out that short periods of collapse were especially useful in the case of children, who were apt to be frightened and nervous at the procedure. Another speaker said that he was not clear whether a distinction was made in this country between cases in which the treatment was undertaken as a curative or as a palliative measure. This, he thought, was an important distinction, if only from the point of view of statistics. He believed that it was better to continue the treatment indefinitely as long as the patient was doing well.

MEDICAL OFFICERS OF SCHOOLS ASSOCIATION.

AT a meeting of this Association held in London on Oct. 19th Dr. L. R. LEMPRIERE took the chair in the absence of the President, and Surgeon-Commander S. F. DUDLEY read the paper on

MICROBIC DISSEMINATION IN SCHOOLS

which appears on p. 849 of our present issue.

Dr. G. E. FRIEND, in opening the subsequent discussion, said that as soon as he began school work in 1923 he was struck by the large number of cases of medical illness which he thought should be preventable. Though now less innocent as regards the comparative agnosticism of the ordinary school authority in regard to biological phenomena, he still regarded the majority of these cases as preventable, but he was less certain whether medical officers were quite wise in trying to obtain too complete an immunity. Droplet infection—if the term included, as he thought it should, all the exanthems—accounted for over 70 per cent. of the total medical disability of Christ's Hospital School, and so far as he could judge from figures obtained from other schools this was a fair average. Taking two ten-yearly periods, for the second of which he had personal knowledge, the number of cases of medical illness worked out as shown in Table I.

TABLE I.

—	1903–12.		1913–22.	
Exanthems, &c.	2039	70 %	1998	77 %
Chills and tonsillitis	3616		2942	
Gastro-enteritis	1094	14 %	539	8 %
Various	838	11 %	886	14 %
Total	7587		6365	

Average days lost per boy, 6·0. 1923–28 show a reduction.

Thus only 11–14 per cent. of the illness was due to what must at present be regarded as unavoidable medical disability, while 84–85 per cent. was due to either droplet infection or gastro-enteric disturbance, a large proportion of the latter being caused by parental agency. On a conservative estimate at least 60–70 per cent. of this disability should theoretically be preventable. Isolation of infectious diseases combined with the exclusion from school of known contacts—a method in operation in most public schools since the Association published its code of "Infectious and Contagious Diseases in Schools" in 1888—had had a somewhat curious result so far as Christ's Hospital School was concerned. Accurate figures were only available for the period of 1902–28. Dividing this period into two equal parts the figures were as shown in Table II.

TABLE II.

—	1902–13.	1914–26.
Number of epidemics	119	89
Total number of cases	2048	3329
Average number of cases per epidemic ..	17	38
Epidemics with under 10 cases	79	53
,, of single case	34	25
,, of over 50 cases	11	24

1927–28 show a marked reduction pro rata, but the time is too short for the figures to be of value.

The result of this attempt at *prevention* had thus been a reduction in the number of epidemics by 30 with an *increase* in the total number of boys infected by 1281. Further, while the number of big epidemics of over 50 cases per epidemic had more than doubled, the number of epidemics with less than ten cases had been reduced by more than one-third. It was also undoubtedly true that in the case of measles, which only occurred in epidemic form when the proportion of non-immunes rose above 10 per cent. of the population, the type of disease was more severe and the number of boys who developed complications, especially in the later half of the epidemic, had more than doubled in the second period. Though exact figures before 1900 were not obtainable, the records definitely pointed to a more frequent occurrence of epidemics with a smaller number of cases per epidemic. Statistics as to the number of cases with complications for this early period were not available. Dr. Friend had little doubt that these figures provided definite evidence in favour of Surgeon-Commander Dudley's theory of droplet infection and supported his suggested doubt about the wisdom of trying to proceed too far in prevention.

TABLE III.

—	Dormitory.	Day-room.	Class-room.	Infirmary wards.	
Length ..	90	50	22	36	26
Width	21	21·5	21	25	25
Height	12	12	12	12	12
Cubic feet ..	22,200	13,000	5,500	10,800	7,800
Window area	200	220	100	220	120
	−117	+35	+22		
No. of boys ..	25	50	25–30	10	6
Cubic ft. per boy	888	260	220–183	1,080	1,300
Floor space ..	75	21·5	18·5–15·4 sq.ft.	109	100
Headroom ..	7·5	—	—	7·2	8·7
Inter. bed ..	4·5	—	—	4·2	5·7
Space between opposite beds	9	—	—	13	13

In regard to the auto-inoculation of non-immunes to measles during an epidemic the following figures were of interest: in January, 1921, 61 cases had occurred. The card-index had shown that there were 146 non-immunes. As the result of more careful inquiry these were reduced (41 per cent. of the non-immunes) to 104. The epidemic had affected every house in the school and 43 boys had escaped infection over a period of 44 days, though all were equally exposed to infection. The three other epidemics of 20 cases or over showed that from 10 to 35 per cent. of the non-immunes escaped every epidemic. In the two epidemics of over 50 cases the number of cases with complications was 15 per cent. and 60 per cent. in totals of 61 and 142 respectively, while the percentage in the small epidemics was either zero or negligible.

Dr. Friend concluded by giving the measurements of rooms at Christ's Hospital School (Table III). It should be noted that in the dormitories the boys spent an average of 10·5 hours at rest in 888 cubic

feet with 75 square feet of floor space, and 7 feet of headroom. In the dayrooms the same boys spent 3 hours in summer and from 5 to 7 hours in winter working and playing at tables in close proximity—most of this time in less than 260 cubic feet, with only 21·5 square feet floor space, and not 2 feet of headroom. An average of 4 hours daily for 6 days per week was spent in the classrooms with desks in close proximity in less than 200 cubic feet and with 15 to 18 square feet of floor space, and 2–3 feet of headroom. Other things being equal, there was therefore much more likelihood of droplet infection in the dayroom and classroom than in the dormitory.*

Dr. P. M. MAY said that it diluted his enthusiasm to hear that by giving such assiduous care to reducing the incidence of zymotic diseases in such special schools as the one at Greenwich, the best was not being done for the health of those boys whose career was destined to be in the Royal Navy, seeing that the conditions in the Navy were not likely to be as good as those in the school. It was agreed among medical men that the larger the space procurable per boy or girl the better, but those responsible for constructing and maintaining schools could not always be persuaded of this, especially when applications for places in the school were numerous. There was need for general enlightenment as to the spread of infection in school dormitories.

The CHAIRMAN said that droplet infection was so much on the increase, and the facts in regard to it so clear, that nothing should be neglected in the effort to improve conditions. Influenza and the ordinary feverish chill—he regarded the latter as the great danger of all school life—had doubled in the ten years 1903–12. Droplet infections should not be allowed to remain such a scourge of school life; they caused much more loss of time and were a greater danger to life than all the exanthemata combined. He hoped for a good deal from vaccine therapy. It was true that amid infective conditions a boy might be gradually acquiring immunity, but it was at considerable risk of breaking down and becoming the victim of some permanent damage. He had tried a general vaccination in his own school, but the number of parents willing to have this done was a diminishing quantity.

Dr. J. G. FORBES said this question of the spread of infection had a very wide bearing; it was concerned in every closely aggregated community, and especially in residential institutions. In class-rooms close contiguity was unavoidable; therefore careful attention should be given to ventilation. In influenza epidemics, 'buses, tubes, and trams were great factors in the spread of the infection. Further factors were humidity and barometric pressure. The gradual development of immunity in the individual as an element of protection to the herd was a large question, and the references to it in the paper afforded valuable food for thought.

Dr. J. A. GLOVER thought the special case of the sailor, to which Surgeon-Commander Dudley had drawn attention, should not obscure the general question of the reduction of the amount of illness due to droplet infection, especially as the risks of aural disease, pneumonia, &c., were so well known.

Surgeon-Commander DUDLEY, in reply, said the main point was whether it was better to have large batches of very severe cases separated by considerable intervals of time, or a succession of small groups of cases, less severe, which occurred in the process of building up immunity in the herd. He had experience of an epidemic of diphtheria in a small place in New Zealand of 1500 inhabitants where there had been no case of the disease for ten years. There were many cases and a number of deaths, and the morbidity in four months equalled that of 30 years in London. He agreed that the great hope was to carry out efficient vaccination. This certainly had the effect of greatly increasing the natural resistance of the recipient.

* A Memorandum on the Accommodation for the Sick provided at certain Public Schools for Boys in England, by Capt. W. Dalrymple-Champneys, M.R.C.P., has now been issued by the Ministry of Health. (London: H.M. Stationery Office, pp. 35, 1s. net.)—ED. L.

INTERNATIONAL SOCIETY OF MEDICAL HYDROLOGY.

ANNUAL MEETING IN ENGLAND.

(*Concluded from p. 815.*)

THE Society was received at Harrogate on Oct. 12th. Dr. W. EDGECOMBE, Vice-President, welcomed the members and gave an account of the various types of waters, after which parties of various nationalities, with interpreters, viewed the bath establishments. In the evening a banquet was given by the Mayor and Corporation, and the representatives of France and Germany proposed the prosperity of Harrogate.

The Third Medical Discussion on the

SPA TREATMENT OF CHILDREN

took place at the Royal Mineral Water Hospital the following morning. Dr. ARNIM KELLER (Switzerland), in a paper on the use of brine baths, gave the results of 20 years' experience in the children's department (114 beds) at the Spa Hospital at Rheinfelden. Up to the end of 1927, 10,107 children, of an average age of 10 years, had been treated with these baths, usually with excellent results. The great majority of the children showed "general weakness, lymphatic constitution, or scrofulosis," but "surgical" rheumatic and heart cases also did well.

Prof. GROEDEL (Bad Nauheim) spoke of the value of CO_2 baths in children after rheumatic endocarditis, as well as in the circulatory disorders associated with malnutrition and anæmia. In congenital cardiac cases compensation was often improved by these baths.

Dr. SIGMUND WASSERMANN (Franzensbad and Vienna) contributed an interesting paper on the action of ferruginous waters. Recent work had shown that only the unstable ferrous salts, such as those that occurred in absolutely fresh chalybeate waters, were therapeutically active. Such waters, as well as mud baths, had a definite use for delicate, anæmic, and catarrhal children. Prof. J. D. STANLEY (Birmingham) reported on the use of hot packs or baths in chorea. In many cases good results were obtained. The subnormal temperature observed was probably due to derangement of heat control by rheumatic infection.

Dr. ANGLADA (la Bourboule), in a paper presented by Dr. Ferryrolles, held that the muriated arsenical waters which are extensively employed for children are of benefit in three types of disorders: (1) of mucous membranes, (2) cutaneous, (3) arthritic.

A paper was also communicated by Dr. CATTANEO (Salso Maggiore) on the use of "dry pulverisation" of chloride-iodide waters. In an atmosphere so charged the dry particles find their way into the pulmonary alveoli and favourably affect both local catarrhs and the general want of resistance so commonly met with. This form of treatment may be used with much advantage in the first two years of life.

In the subsequent discussion it was remarked that most of the methods of treatment described were recommended for similar types of patients, and it was suggested that a more precise differentiation of methods, with corresponding indications, should be studied at the next annual meeting in Hungary.

After the meeting the members enjoyed a clinical demonstration of various forms of arthritis given by the hospital staff. Dr. J. A. THOMSON showed series of radiographs of osteo-arthritis, and described in joints so affected small areas of rarefaction, or cavities, surrounded by an osteo-sclerotic wall, suggesting that simultaneous bone destruction and bone defence was characteristic of this disease.

In the evening the party was entertained by the Harrogate Medical Society.

The final discussion of this meeting took place at the Devonshire Hospital, Buxton, on Oct. 15th. Dr. C. W. BUCKLEY presided in the absence of Lord Dawson. The aspect of

RHEUMATISM AS A NATIONAL PROBLEM

was dealt with in a series of reports from seven

different countries. Dr. HENRI FORESTIER (Aix-les-Bains) spoke for the Association which has been formed in France to deal with the question. Prof. PRUSIK (Prague) said that in Czecho-Slovakia a widespread scientific and public propaganda was in progress. Dr. ZOLTAN DALMADY (Budapest) mentioned that rheumatism was rarer in Hungary than in many other European countries. The use of mineral baths was habitual and popular in Hungary. Dr. MAX HIRSCH (Berlin) stated that they had come to the conclusion in his country that it would be better to form a society to combat rheumatism, in order that they could be registered and have the support of the State. He had collected statistics of the incidence of rheumatism in Germany, and found that the figures were similar to those for England. They in Germany had also formed the opinion that the influence of rheumatic diseases upon industry was more serious than that of tuberculosis. "The German Society is much impressed by the possibilities of international coöperation," he added. Dr. ZIMMER, secretary of the German Society, gave an outline of its programme (see *Arch. of Med. Hydr.*, August, 1928).

Appreciative references to the work of the International Society were made by Dr. J. VAN BREEMEN (Amsterdam). "Good organisation is essential," he stated, "but actually it is nothing but a shell, and if no flesh and blood be added, the organisation soon shrivels up to a skeleton. It is, therefore, a most important fact that in the course of the two years the International Committee has existed the firm foundations have already been laid for a grand edifice, the completion of which will take years yet, but which bears the unmistakable signs of solid construction."

Dr. R. FORTESCUE FOX (London) said that in England they had been very fortunate in that they had had the assistance of representatives from the Ministry of Health, the London County Council, the British Medical Association, and, equally important, the great industrial organisations. "I think the resultant coöperation of industrial and medical men has already been invaluable in our country," he added. In some other countries they had not had that coöperation. Referring to the efforts which had been made to widen the scope of spa treatment, Dr. Fox said they could not dream that the whole of the population could be treated at the spas, so they were bound to consider the provision of centres for treatment of rheumatic diseases in the towns, as in some other countries.

Further reference to rheumatism clinics was made in a paper by Dr. A. R. NELIGAN, read in the compiler's absence by Dr. W. S. C. COPEMAN, one of the honorary secretaries. The English spas, he said, are good, well staffed, and well equipped, and their more general use should be urged. On the continent going to a spa is regarded much in the same light as going to a pharmacy in England, but the spa does not solve the whole problem of chronic rheumatism even on the continent. There had been set up, therefore, in the large cities a system of clinics for the treatment of rheumatism. In New York and other cities of America arthritis clinics were becoming common. Such clinics should be centres of research in rheumatic diseases, of diagnosis and special treatment, in full coöperation with hospitals and health resorts.

Following brief reports from Swedish, Portuguese, and Danish representatives, Mr. W. A. APPLETON (General Federation of Trade Unions), speaking on behalf of the friendly societies, agreed that rheumatism was a national problem. It divided itself automatically into a medical side and an economic side—he would confine his remarks to the latter. First mentioning that in the friendly societies' membership there was required 18,000 weeks' treatment per year, Mr. Appleton stated that there was a great deal of misunderstanding regarding the money held by the insurance societies.

Doctors refer to it as surplus, he said, but we speak of it as reserve built up against contingent liabilities. He urged the medical men to be sympathetic if the societies appeared to go slowly with regard to the treatment of rheumatism. It is due entirely to financial doubt, he explained. Mr. Appleton prophesied that within a comparatively short period, perhaps two or three years, some rational scheme would be in operation.

Discussion.

Dr. G. L. KERR PRINGLE (Harrogate) suggested that if clinics were established the cases treated there might become chronic, and that chronic cases would be sent to the spas.

"The places to treat rheumatic diseases are the spas," was the view of Dr. JOHN MURRAY (Llandrindod). It was important, he added, that our working classes were kept sound and well. If we, as a nation, could not afford two or three millions a year to do this, and yet could spend 800 millions on other things, then it was time the government of the country was altered. Every county should have its rheumatism officer, just as it had its tuberculosis officer. The friendly societies should not be saddled with the burden alone. It was a national problem, not only involving people who work with their hands, but also those who work with their heads.

In summing up, Dr. BUCKLEY made reference to each report which had been given. Speaking of the German report, he remarked that Dr. Zimmer had said they in that country had the moral and *financial* support of their Ministry. Already we in England have our Ministry's moral support, he added, and we trust that in the future, as the result of the force of public opinion, we also shall have the financial support. Dealing with Mr. Appleton's comments on the question of the friendly societies' finance, Dr. Buckley suggested that surely rheumatism could be regarded as one of their most serious "contingent liabilities." So long as the insurance companies allowed so many weeks of labour to be lost through this disease, they must expect a heavy drain upon their resources.

At a meeting of the members of the former International Committee on Rheumatism, held in the Devonshire Hospital, at Buxton, on Oct. 15th, an International League against Rheumatism was duly constituted. Representatives were present of the national committees and associations for combating rheumatism in Germany, France, Czecho-Slovakia, Hungary, Holland, Sweden, Switzerland, and England. Other delegates of the committees in Russia, Austria, and Belgium sent their adhesion in writing. The following officers were appointed: Chairman, Dr. Fortescue Fox (pro tem); vice-chairman, Prof. Dietrich; hon. secretary, Dr. van Breemen. The central office is: 489 Keizersgracht, Amsterdam. The functions of the League, as of the former International Committee, will be mainly advisory and coördinative.

At Droitwich Spa the Society was warmly received and entertained to lunch and tea by the Corbett Trustees, and under the guidance of local medical men, members were given an opportunity of seeing one of the strongest brines in the world. The possibilities of Droitwich as an international spa, especially for children, were referred to by several authorities present.

The annual meeting tour ended with a visit to Bath, where the various baths and springs were studied, and where members had the opportunity of clinical demonstrations by the local physicians of rheumatic cases at the Royal Mineral Water Hospital, besides inspection of the Roman baths and town.

Throughout the tour the Society was received with the utmost hospitality and kindness, the Mayor and Corporations, the local medical societies, and baths committees vying with each other in providing banquets, civic lunches, and interesting excursions.

Next year's meeting will be held in Hungary early in October.

ROYAL SOCIETY OF MEDICINE.

SECTION OF MEDICINE.

ON Oct. 23rd, with the Vice-President, Dr. ROBERT HUTCHISON in the chair, this Section held a meeting (to which the Section of Psychiatry was invited) to discuss the subject of

HYPOCHONDRIA.

Dr. R. D. GILLESPIE, in his opening paper, said that the condition was one of a distinct reaction type, which was well worth isolating, because of its therapeutic and prognostic aspects. It was not a disease. It had long been, and still was, identified and confused with melancholia, hysteria, neurasthenia, and certain other conditions. Some older psychologists spoke of a "hypochondria cum materia" when gross organic disease was found and "hypochondria sine materia" when no important physical disease was evident. It was a matter of controversy whether hypochondria existed per se, or only as part of a larger symptom-complex. He believed such a syndrome could usefully be distinguished. It was a subject which at the present day suffered from comparative neglect. He considered hypochondria to be a persistent preoccupation concerning the bodily health to a degree in excess of what would be justified by any physical disturbance which happened to be present; an emotional attitude which was best described as interest with conviction, anxiety (in the sense of a fearful apprehension of disease) being absent. In the patient's mind the presence of disease was a settled conviction. This condition, Dr. Gillespie contended, was inaccessible to psychotherapy, and ran a chronic course without intellectual or emotional deterioration. For a long time hypochondria was considered to be a form of neurasthenia; Kraepelin, in fact, placed it among the neurasthenias. It should be differentiated from anxious preoccupation. Depression or affective sadness was no part of the concept. Whereas the hysterical patient was susceptible to reassurance, the hypochondriac was not. Hypochondria developed in the type of person who had led a subjective and solitary life. The common-sense view of the condition was that it consisted not of the direct expression of organic brain disease, but rather of a reaction to influences, either external or internal, as an excuse for voicing some trouble. The fixity of the symptoms was attributed to habitual self-centredness. The condition usually arose in later life, at which time there was said to be an increasing tendency to become largely interested in the bodily health. The common-sense view left untouched, however, the reason why such self-centredness existed, and why there was this fixity. The alleged preponderance of hypochondria in the male sex was explained by the fact that similar manifestations in the female were designated hysteria, though the speaker contended that there a distinct difference between the two conditions.

The prognosis of hypochondria, Dr. Gillespie continued, must depend in part on the relative importance of the exogenous and endogenous factors. The more the condition seemed dependent on a physical abnormality, the more likely were the symptoms to disappear when that had been dealt with; but when it was rather an outgrowth of the personality the outlook was more doubtful, as the personality was so often suffused with unhealthy attitudes. Cases in young persons might be regarded as more favourable than cases in the old. By way of treatment any organic disease present should be dealt with. These people did not lend themselves to profound analysis, but common-sense measures, such as change of occupation and environment, should always be tried.

Discussion.

Dr. R. S. ALLISON agreed that hypochondria could be regarded as a definite entity, and not merely as a variety of some other condition. Often the physician was confronted with a patient who showed no abnormality save an undue concentration on his bodily sensations; but hypochondria was more than that. In fact, it did not differ greatly from the anxiety of neurasthenic states. He liked Dr. Gillespie's definition that it was "an interest with conviction." A distinctive point was the patient's persistent search for a cure, by means which even the sick man would not resort to. When the symptoms were said by the patient to centre around the alimentary tract, it was important to search for any cause of real symptoms, though the hypochondriac was a difficult subject to investigate, and might be in such a hurry for results that he was unwilling for a barium meal to pass naturally, but quickened it by taking purgatives. When a person had had an operation at some previous time the possibility of there being adhesions should be looked into. To try to remove the patient's false impression was to embark on a forlorn hope. If organic disease contributed to the trouble, removal of this rendered the prognosis much more hopeful than when there was no such disease. The inculcation of good daily habits, such as the regular use of liquid paraffin, would do much. It was also rational to give bromide in small regular doses.

Dr. W. R. REYNELL considered that Dr. Gillespie had established his thesis that there was a definite clinical entity such as he described, though—as so delimited—it was rare. His remark that there was a preoccupation in excess of what the physical symptoms justified presented a difficulty, Dr. Reynell thought, as it was difficult to assess what degree of preoccupation was justified in a case of marked visceroptosis. He did not agree that when disease was absent though the patient considered he had it the case was inaccessible to psychotherapy. In a large number of cases this treatment was possible. He thought it was often possible to tell, even in childhood, what type of person was liable to become a hypochondriac. It was the person of low vitality and low blood pressure, of the toxic, debilitated type—a type abnormally liable to feelings of illness—and very hyperæsthetic. In a word, these patients were prone to dysæsthesia, and it was possible to benefit them greatly by rational psychotherapy. The best drug for them was the spoken word—spoken in the right way.

Dr. T. A. ROSS thought it would be a great achievement to be able to determine which psychoneurotic cases were likely to benefit from treatment and which were not, as treatment took a long time, and energies could thereby be conserved for the hopeful cases. There was a type of old man in this category who was quite inaccessible to treatment; the important thing for such a patient was to keep him out of the hands of quacks. He thought that Dr. Gillespie's description was a description of a type of life rather than of a disease.

Dr. C. P. SYMONDS also thought that the opener had established a very definite clinical picture, but he did not feel so certain that he had shown it to be a definite type of mental reaction separable from the manic-depressive and hysterical groups. The form associated with manic-depressive psychoses was the one too often missed by the general practitioner and the general physician; he referred to the mild depressive psychotic whose symptoms were expressed rather in the way of bodily symptoms than as a frank mental disorder. Most of them were sent to the neurologist with the diagnosis of neurasthenia, but by that time they had usually been under one or more operations. Too often in these cases a history of some previous nervous breakdown was not pointedly inquired for. Apart from such a history there were associated symptoms and signs of value in diagnosis, such as self-depreciation and self-reproach, with a sluggishness of response, evident to the patient and supported during the physician's examination. There was also a tendency to a marked increase in the symptoms in the early part of the day, with a distinct lifting of the cloud as the day advanced. The manic-depressive group were relatively inaccessible to psychotherapy, but not so the young people whose fear was

not based on a settled conviction of disease. This difference might be one merely of degree, not a qualitative one. The schizophrenic with hypochondriacal symptoms might be difficult to diagnose in an early stage. He discouraged the idea of making inaccessibility to therapy a criterion of diagnosis.

Dr. PARKES WEBER thought the term hypochondria should be limited to the kind of case to which Dr. Ross referred.

Dr. F. DILLON spoke of the sadism which was so often expressed in the hypochondriacal state. It was difficult to conceive that a man who insisted on half a dozen abdominal operations was doing it from any mere egoistic motive; the most probable explanation, he thought, was that the man was identifying himself with someone else, and in that way was deriving antagonistic satisfaction.

Dr. JOHN CARSWELL said his hope had been that the term hypochondria, if employed at all, would be restricted to the involutional case. He had seen hypochondrial symptoms as the earliest manifestations of general paralysis of the insane; sometimes in early phases of dementia præcox. Even a patient with delirium tremens might display, in the pre-delirium stage, a restless anxious reference to bodily symptoms. He had never seen a hypochondriac who got the better of the physical condition who did not carry out self-treatment in defiance of his medical man, and some such lived to a good age. He was always self-centred, bent upon giving himself a good time, and he rigorously shut out of his mind all other considerations.

The CHAIRMAN said that he, in common with every general physician, saw the hypochondriac as an ordinary harmless person, and one who certainly was not insane. He agreed with the opener that the hypochondriac was usually an elderly gentleman who had retired from business, and who collected symptoms, very much as another old gentleman would collect postage stamps or old china. His health had, in fact, become his hobby. True, most of the items in his collection were fakes, but every now and again he came upon something which was real, and this was apt to be overlooked by the physician, who had arrived at the conclusion that it was all fake. Such a man was harmless and incurable; indeed, the speaker did not want to cure him, for, from the point of view of the patient, it would be unkind to do so. The hypochondriac was said to be egocentric, but he was not always so, for one could recognise the vicarious hypochondriac. Numbers of parents were desperately hypochondriacal about their children, but not about themselves. The extravagantly fussy type of parent was well known. Even a whole nation could become hypochondriacal. A case in point was the Jewish race. Ever since Moses was so ill-advised as to lay down for the people's observance a sanitary code, they had been a nation which had devoted far too much attention to ills and the discovery of imaginary illnesses. Hysteria had always seemed to him to be something different. The hysterical person seemed to have some definite purpose to serve in his manifestations, whereas the hypochondriac's collection of symptoms seemed purposeless, being rather in the nature of some definite occupation. As Dr. Gillespie said, there was but a small literature on the subject, yet it would always remain for the physician one of very great interest.

Dr. GILLESPIE, in reply, said he did not include among hypochondriacs those who suffered from visceroptosis. Even among presumably educated people physiological knowledge was still very inadequate. Often the type of subjects under discussion suffered from an ever-present consciousness of guilt.

LONDON FEVER HOSPITAL.—This institution, in Liverpool-road, Islington, which was founded in 1802, and has 178 beds, is seeking to raise £50,000 by the first general appeal it has ever made. A new isolation building is a pressing necessity, the old one being out of date and beyond repair. It is pointed out that this is the only voluntary fever hospital in and around London.

Reviews and Notices of Books.

STERILITY IN WOMEN.

Diagnosis and Treatment. By SIDNEY FORSDIKE, M.D., B.S. Lond., F.R.C.S. Eng. and Edin., Surgeon to the Hospital for Women, Soho-square. London: H. K. Lewis and Co., Ltd. 1928. With 25 illustrations and 17 plates. Pp. viii.+133. 9s.

So many advances have been made in the diagnosis and treatment of sterility during the last ten years that Dr. Forsdike has been tempted to give some account of these from his own wide experience. The method of investigating a case is well and clearly described, and the case sheet devised by the author will prove useful to other workers. Stress is laid on the importance of examining the husband who, according to Dr. Forsdike's records, is responsible for sterile union in 25 per cent. of cases. "In ordinary cases the investigation of the woman ceases at the bimanual examination until a report has been obtained of the man's condition." The technique of tubal inflation as practised by the author is fully described. No anæsthetic is used, and a pressure of 300 mm. Hg is considered safe. Out of 100 cases in which the tubes were inflated 15 became pregnant without further treatment at periods varying from 1 to 12 months. Later in the book it is stated that unless the pregnancy occurs within three months of the inflation it cannot be regarded as due to it; if this test is applied only 7 of the 15 can be regarded as possibly due to the inflation, and three of these occurred in patients married only two years. Even when the strictest tests are applied, however, the author's contention that inflation alone is responsible for the cure of sterility in certain cases is borne out. If pregnancy does not follow in three months after inflation lipiodol is used and a hysterogram taken. This method of demonstrating the site of obstruction in closed tubes was described by Dr. Forsdike in 1925, and since then he has used it in a large number of cases. His technique is clearly described, and excellent pictures illustrate X ray findings after injection. Of 67 cases in which lipiodol was used, the tubes were found to be patent in 41; of these 41, pregnancy followed in 14 without any further treatment. A critical examination of the details of these cases will perhaps carry less conviction than the cases of pregnancy after inflation, but as to the value of lipiodol as a diagnostic agent there can be no doubt. The chapters on treatment leave nothing to be desired. In tubal obstruction the author recommends operation only when the closure is situated at the fimbriated end; even then, in 20 cases in which an opening was made at this end, 11 were found to be closed again in three months, and only two of the 20 became pregnant and bore living children. Excision and anastomosis of the isthmus and implantation of the distal end of the tube in the uterine wall are condemned. In none of ten operations of this kind did air pass at the end of the operation. Dr. Forsdike concludes that "operations upon this part of the tube offer no prospect of relieving sterility." It is unfortunate that a book so excellent in substance should here and there be disfigured by sentences carelessly constructed. On the first page, for example, sterility is defined as "a woman who offers no evidence of being fertilised." Moreover, though the causes of sterility are thoroughly discussed, the classification is confusing and does not seem to be adhered to even by the author. Thus the Empress Josephine is classed as "relatively sterile," while at page 19 "relative sterility" is included as a variety of "congenital." Surely she was really an example of "secondary sterility" following infection after her second labour.

The monograph shows in every page evidence of rich personal experience, and will well repay the most careful study.

PSYCHOLOGY AND PHYSIOLOGY.

Common Principles in Psychology and Physiology. By JOHN MACCURDY, M.A., M.D. (Johns Hopkins). London: Cambridge University Press. 1928. Pp. 280. 15s.

THE time has not yet arrived when the problems of psychology and physiology can be satisfactorily solved in terms of one another. It belongs to philosophy alone to establish a unification of all the phenomena—mental and physical—that make up the organism. But the workers in both fields need to understand one another's aims, and seeing that a considerable amount of overlap takes place controversy over territorial rights may arise from time to time which are profitable to neither side. Dr. Maccurdy's effort to produce a common vocabulary which shall help psychologists and physiologists to work side by side to further these ends which they have in common must therefore be welcomed. In the pattern theory, familiar to us in the mnemic theory of Semon, the author finds convenient ground to work on, and his book is mainly concerned with the establishment of the way in which patterns are found in, and can be used to explain, the phenomena of body and mind. Behaviourism alone, however, will not explain the growth of experience, and unless mental categories are considered such facts as W. Kohler collected on the behaviour of apes, or the processes found in neural integration and the development of the embryo, are incomprehensible. The first steps in correlating different aspects of knowledge cannot be expected to lead to a terminology which will be acceptable from all points of view, and it is satisfactory to see that anyhow a start has been made on sound lines.

Principles of Abnormal Psychology. By E. S. CONKLIN, Professor of Psychiatry in the University of Oregon. London: George Allen and Unwin. Pp. 457. 15s.

Prof. Conklin has given us a very interesting volume on the elementary data of abnormal psychology. The merits of the work lie mainly in a mine of information relating to the psychosis, psychoneurosis, and the analytic approach and its effects. It also has the merits of bringing into the orbit of psychopathology the phenomena of spiritism and sleep. All subjects are dealt with in an entertaining and stimulating way. The demerits of the book in form and content cannot, however, be ignored. For example, illusion and hallucination are dealt with before the fundamental facts of memory and its anomalies are discussed. The psychoses are considered before the psychoneuroses or shell shock. These sections are full of information, but the views are not sufficiently developed to include the most recent developments in Freud's position, nor the psychiatric advances in Germany and Switzerland by E. Kretschmer and E. Bleuler. The time may not yet have arrived for the correlation in a textbook of the recent work on sleep. But in a volume of this size and character space might have been found for a consideration of the sleep and behaviour disturbances in encephalitis lethargica and their relation to the physiology of the mid-brain as exhibited in the narcolepsies, and the cortical inhibition theory of Pavlov. The book, however, should prove stimulating to the elementary student of psychopathology who wants a lot of practical matter in a compact form without too much speculation.

A TREATISE ON KALA-AZAR.

By UPENDRANATH BRAHMACHARI, K.I.H. Rai Bahadur, M.A., M.D., Ph.D., late Physician, Medical College Hospital, Calcutta. London: John Bale, Sons and Danielsson, Ltd. 1928. Pp. 252. 21s.

SEVERAL books dealing with different aspects of kala-azar have recently appeared, but none of them can compare with the present volume, either in wealth of information supplied, or in style of production. The main outlines of the treatise were sketched out by the author in the third edition of Mense's "Handbuch der Tropenkrankheiten." The work now published is more exhaustive, and is divided into sections dealing with history, ætiology, inoculation experiments and lesions produced in experimental animals, the transmission of the disease, especially by the sandfly, canine leishmaniasis, the clinical varieties, complications, prognosis, diagnosis, pathology, treatment, and prophylaxis. There are numerous appendices and a very complete bibliography. The monograph is indeed comprehensive, and supplies a useful account of the author's own original work on this disease, as well as a balanced comment on that of others.

From a strictly clinical aspect the section on symptomatology is neither so exhaustive nor expressive as the others. It is perhaps unfortunate that the book has appeared at a time when the mode of transmission of kala-azar is still being worked out, so that it has not been possible to express conclusions other than tentative ones regarding the sandfly question. The section on treatment is very good, special prominence being given to treatment with urea stibamine, the compound of urea with stibanilic acid discovered by the author in 1921. He has shown that its toxicity to humans is low and its curative power as great, if not greater, than other pentavalent compounds of antimony. The monograph is well illustrated with 12 plates, several coloured, mainly derived from other publications, and some 32 text figures.

FOOD, HEALTH, VITAMINS.

Being a new edition of Food and Health. By R. H. A. PLIMMER, D.Sc. Lond., Professor of Chemistry in the University of London, at St. Thomas's Hospital Medical School; and VIOLET G. PLIMMER. London: Longmans, Green and Co., Ltd. 1928. Pp. 120. 3s.

VITAMIN lore accumulates so quickly that any up-to-date book on the subject has an enormous advantage at the time of its appearance over any other. This volume contains an account of the differentiation of vitamin B 1 from vitamin B 2, and of the latest discoveries about vitamin D, and is therefore, if only because of the inclusion of this material, a useful and helpful contribution to the literature of vitamins. Prof. and Mrs. Plimmer set out to describe the chief facts about diet in a way which everyone can understand, and though the exposition is not always as interesting as it might be, the information given is sound enough. Most research workers tend to cherish a belief that the population of Great Britain for the most part suffers from a partial lack of some given vitamin, and that if the lack were made good the public health would greatly benefit. The authors of this book favour a deficiency of vitamin B 1, and therefore plead for a greater consumption of substances which contain it. Others who hold that vitamin D is more likely to be the chief defaulter will suffer a shock when they read that the adult "can safely eat margarine instead of butter" provided that he eats the other foods named. The authors' view, however, is confirmed on other grounds by the most recent work of the Pharmaceutical Society's Laboratories, published in our issue of Oct. 6th.

The science of dietetics is one in which it is very hard to make dogmatic pronouncements, while it is one in which there is a clamorous demand that generalisations should be provided for the public. On the whole Prof. and Mrs. Plimmer have provided a useful book: it contains a few inaccuracies and one or two bits of very strange English, but the layman will carry away from it much that is helpful and little that is actually misleading. The book is certainly among the best of its size and scope and meets the demand for information on a subject of growing importance.

ATOMIC STRUCTURE AS MODIFIED BY OXIDATION AND REDUCTION.

By WILLIAM COLEBROOK REYNOLDS, D.Sc., F.I.C., A.R.C.S. London: Longmans, Green and Co. 1928. Pp. 128. 7*s*. 6*d*.

THIS is a theoretical investigation of the structural changes which are supposed to occur in atoms during the processes of oxidation and reduction. Starting with the thesis that electrons fall naturally into three classes according to their functions—namely, valence electrons, potential valence electrons, and radial quartets and pairs—Dr. Reynolds proceeds to characterise these three groups. In his view the recognition of the part played by these potential valence electrons leads to a modified conception of the periodic classification of the elements. Two chapters are devoted to the oxidation and reduction of typical inorganic and organic compounds, while subsequent chapters deal with the nature of chromophores, the emission and absorption of radiation, the structure of solid conductors and magnets, and electrons, protons, and ether.

Many of the ideas put forward by the author are unorthodox, and he is to be congratulated on having written a stimulating and suggestive little book.

THE LIFE OF THE CELL.

By DAVID LANDSBOROUGH THOMSON, M.A., B.Sc., Ph.D., Lecturer in Biochemistry, McGill University, Montreal. London: Thornton Butterworth, Ltd. 1928. Pp. 252. 2*s*.

WITH the constantly increasing literature relating to the chemistry, physics, and physiology of the cell it becomes more and more difficult for the average reader to disentangle the various threads and to weave them into a connected whole. Those who have not the time to consult larger works should welcome the opportunity offered by this little book for placing themselves abreast of the more recent developments. In simple language, though without sacrificing essentials, the author discourses lucidly upon colloids, surface activity, enzymes, oxidative mechanisms, genetics, &c. His book is divided into five chapters, the first of which is devoted to the visible structure of the cell, the second to the chemical structure, the third and fourth to the chemical and physical dynamics respectively of the cell, while the last chapter gives an account of the life-history of germ cells. Altogether a very useful little book, and a valuable addition to the Home University Library series.

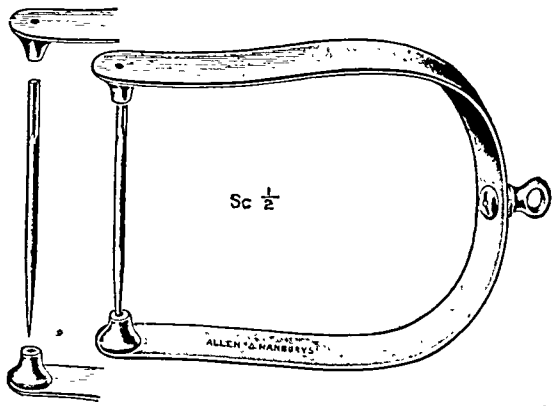
JOURNALS.

AMERICAN JOURNAL OF OBSTETRICS AND GYNECOLOGY. September.—C. A. Gordon contributes the statistics collected by a committee of the Brooklyn Gynecological Society appointed to investigate all cases of Cæsarean section performed in the Borough of Brooklyn from 1921 to 1926. This was inspired by the investigation carried out in this country under the direction of Eardley Holland, whose results were published in the *Journal of Obstetrics and Gynæcology of the British Empire* in 1921. A total of 1805 cases are surveyed, and though no conclusions have been drawn from the data presented the figures, when combined with the British results, form invaluable material for those working on the subject of Cæsarean section. —H. Bailey, writing on the Long Labour, considers that acidosis is an important factor to be dealt with after a prolonged first stage of labour. Anæsthesia and operative interference should not be attempted until acidosis has been treated.—J. R. Goodall and M. Wiseman, discussing puerperal morbidity, lay stress on the importance of autogenous infection. Organisms present in the vagina or in the cervix are readily destroyed by antiseptics if they are not causing infection of the tissues, but if they are causing catarrh or erosion of the cervix antiseptics are almost useless. The writers advocate early treatment of chronic inflammatory diseases of the cervix as a means of reducing puerperal morbidity. In a paper by A. Mathieu and G. C. Schauffler on the Rigid and Stenosed Cervix during the First Stage of Labour, much emphasis is laid on the importance of fibrosis of the cervix as a cause of true primary cervical dystocia. These observers are dissatisfied with the evidence advanced by those who maintain that the cervix possesses a bundle of circular fibres of a sphincteric type. Delay due to failure of dilatation of the cervix is frequently diagnosed as spasmodic rigidity of the cervix. Usually delay is due to a misinterpretation of the severity of the pains or to voluntary inhibition of the contractions by a nervous patient. Non-dilatation is occasionally caused by syphilis, displacement of the os, adherent membranes, nipping of the cervix, carcinoma, and tuberculosis, but the commonest cause of true cervical dystocia is fibrosis of the tissues of the cervix resulting from chronic inflammation. The subjects of other papers include the Treatment of Asphyxia Neonatorum by the Injection of Alpha-Lobeline into the Umbilical Vein (R. A. Wilson); Primary Bilateral Carcinoma of the Fallopian Tubes (S. A. Wolfe); and Internal Rotation of the Head, with Remarks on the Kielland Forceps (F. P. McNalty). In the last paper the author maintains that the head rotates to the transverse position regardless of its original position. By traction with straight forceps such as the Kielland forceps, rotation should occur. If not, it can be assisted with safety.

New Inventions.

A SPRING CLIP FOR SKELETAL TRACTION.

THE employment of skeletal traction in the treatment of fractures has found a definite place in surgical practice. In the case of fractures of the leg, particularly if they are compound, transfixion of the tibia, and even of the os calcis, is undesirable on account of the risks of bone infection along the track of the pin. This troublesome complication is eliminated by the use of a supracalcaneal pin. It gives a good hold for



applying heavy traction and is easily introduced. I have had a spring horseshoe clip made to pass the pull to the traction apparatus as shown in the illustration, which is more convenient than Steinmann's clamp. The pin is passed through the skin between the posterior aspect of the ankle-joint and the tendo Achillis so as to lie on the upper surface of the posterior section of the os calcis. The use of a rigid pin is more satisfactory in practice than the Finochietto-Chutro stirrup because its use involves less liability to pressure on the skin, and its introduction under local or gas anæsthesia is simpler. The spring clip will also be found handy for holding pins transfixing the tibia or other bones.

The apparatus has been made in two sizes for me by Messrs. Allen and Hanburys, Ltd., 48, Wigmore-street, W.

C. MAX PAGE, M.B., M.S. Lond., F.R.C.S. Eng.

THE LANCET.

LONDON: SATURDAY, OCTOBER 27, 1928.

PUBLIC HEALTH AND LOCAL GOVERNMENT.

At the close of his annual report on the state of the public health (summarised in another column), Sir George Newman declares the principles which should guide the forthcoming changes in local government. The whole medical work of the poor-law, public health, education, factories and workshops, and insurance, should, in his view, be administered by one comprehensive local authority for the whole community in the area. The local authority will have its appropriate committees for securing the efficiency of the various public medical services; but, wherever there are health services to be administered from local rates, the responsibility must be concentrated in a single large-scale unit in each area. One striking feature of this programme is the proposed elimination of the poor-law guardians, and thus another chapter closes in the history of English institutions. From the time of Queen Elizabeth the administration of the poor-law has been a conspicuous instance of English local government. In 1834 the parish was found too small a unit and was replaced by the poor-law union, the new boards of guardians being then created to take over the administrative functions of the overseers. It may be noted in passing that the consequential changes in the law were most imperfectly worked out both at that date and later in 1865 when all expenses of relief were charged upon the common fund of the union and ceased to be parochial charges. The resultant legislative confusion necessitated the consolidation and rewriting of the poor-law enactments last year; before introducing any proposals to change the law, it was essential first to make existing law intelligible. Nevertheless, however obscure the legislation in the middle of the eighteenth century, there could be little doubt in 1869, when the Royal Sanitary Commission was considering the formation of new local sanitary authorities, that the poor-law guardians would form the most appropriate unit for the purpose. Guardians existed everywhere in England; they were popularly elected and were representative; they had medical officers and were already undertaking some measure of sanitary services. They were a better choice than the vestry meeting or the highway board, and so Parliament selected them as the new rural sanitary authority.

This improvisation could not be permanent. The poor-law unions had been created in 1834 under a scheme which took account of the then existing market towns and the means of access and transport available. Far different conditions are visible to-day. For historical reasons each of the old poor-law unions has its own institutional premises; to-day some are almost empty and the medical facilities cannot economically be modernised. Meanwhile other authorities have been created with overlapping functions in the prevention and treatment of disease; the scope of public health services is being constantly enlarged; better coördination is seen to be necessary, and the community increasingly demands a higher standard. Just as in 1834 the parish as a unit was replaced by the union of parishes for poor-law purposes, so now the unions must be replaced by some larger formation for the purposes of public health. The historical perspective must not be forgotten at a time when a natural sentiment is manifesting its regret at the dethronement of the boards of guardians. For the medical profession the changes mean an increased opportunity of official service. Last year, says Sir George Newman, there were 1662 local sanitary authorities and county councils in England with 1233 medical officers of health, of whom only 350 were whole-time officers. Thus the large majority of these local authorities relied for their medical staff work upon doctors mainly engaged in private practice, and, though it would be regrettable if the medical profession were rigidly divided into public and private practitioners, it may well be that the part-time medical officer of health is the victim of certain disabilities and is conscious sometimes of a divided allegiance. Year after year the responsibilities of medical officers expand and a more highly specialised training and experience are demanded. Efficient service means whole-time service in the conditions which exist to-day.

BACTERIAL SYMBIOSIS.

It was, we believe, Shipley who protested in his whimsical way that while we devote much of our time to the care of the malarial man we waste few thoughts on the sufferings of the mosquito. Prof. S. F. Dudley, in an address which we publish this week, asks us in similar vein to pity the poor pathogenic microbe. His avirulent brother, not to be distinguished from him in appearance, lives a quiet and uneventful life in the cavities of his host; smitten by the fates, or waywardly seduced by a Mendelian mutation, the pathogen commits hara-kiri in the very act of his virulence. True, he proliferates more freely; perhaps to him the crowded hour of glorious life is worth an age without a name in a bacteriological handbook. Prof. Dudley's admirable paper is full of such apparent paradox; with Calmette he doubts the benefit to the herd of individual immunity; he shows the carrier to outnumber the afflicted. We are, no doubt, prone to forget that our contact with microbes is mainly by way of symbiosis. With almost all of the pathogenic forms compromise is possible. Even the *Entamœba histolytica* may play a passive rôle, and the streptococcus, potentially perhaps among the most virulent, is present in us all as an uninvited but unobtrusive guest—to the great benefit indeed of one class at least, the maker of vaccines. The value of these guests may be problematical, but many years ago Prof. L. S. Dudgeon advanced the view that the ubiquitous *Staphylococcus albus* provides antibodies effective against its yellow and more virulent cousin. Life without microbes is quite possible—at least, without organisms inside the living body. Pasteur himself was doubtful on the point, and left the problem for later generations to solve—an exceptional restraint in one who solved nearly every problem he envisaged. The digestive tract of infants is sterile at birth; Metchnikoff stated that scorpions and certain worms do not harbour intestinal bacteria; fruit bats and polar bears are said to have sterile fæces. Tadpoles, goats, and hens have been reared in a bacteriologically sterile state. But, like the Fiji Islanders, such inhospitable folk suffer for their parsimony when the day of reckoning dawns and they are exposed to infection. It is perhaps as well that the search for the golden fleece of intestinal sterility has not yet found, among its many argonauts, a successful adventurer. There is, however, another aspect of bacterial symbiosis which deserves mention.

The microbe carrier is in the position of hotel keeper rather than private citizen; he cannot select his guests, and his cosmopolitan visitors may conspire among themselves. The symbiosis of microbes with each other produces problems of another order. KLEIN has shown how the virulence of the diphtheria bacillus is enhanced by the presence of streptococci. The influenza bacillus is rarely found in pure culture; and in artificial media it is often difficult to cultivate unless staphylococci are there too. The presence of other organisms is an important factor in the virulence of the anaerobic bacteria. True it cuts both ways; sprinkling the throat with staphylococcal cultures has been used in diphtheria with the hope, apparently well founded on occasion, that they may outgrow the more dangerous visitor, and cultures of the aciduric group are swallowed by those who desire to restrict their colonic flora. Nor must we forget the bacteriophage, even if we cannot classify it. In fact, to contemplate bacteria in terms of parasites only, and of isolated parasites at that, is to neglect many vital aspects of our dealings with the microbic world.

A NEW TEST FOR PREGNANCY.

ONE of the commonest, and at the same time often one of the most difficult tasks that fall to the lot of the medical man is the early diagnosis of pregnancy. There are few conditions which involve such deep-seated and complex changes with so little demonstrable effect. Some recent workers have put forward a test for pregnancy which is founded on a new principle—the presence of certain hormones in much increased amount in the blood and urine during pregnancy, and the demonstration of their presence by simple biological tests. These hormones are those of the ovary and of the anterior lobe of the pituitary. With the ovarian hormone the laboratory worker is now well acquainted; the proof of its isolation and action in promoting the growth of the uterus and bringing about œstrus in castrated female animals is complete. The nature of the anterior pituitary secretion is not yet quite so well defined. Since PIERRE MARIE in 1886 described the condition of acromegaly and observed that the disease was associated with tumours of the pituitary body, the nature of the effect of the anterior lobe on growth has monopolised the attention of scientific workers. Its interrelationship with the ovaries has long been suspected, however, and during the last two years has been strikingly confirmed by B. ZONDEK and S. ASCHHEIM in Germany and independently by P. E. SMITH and E. T. ENGLE in America. The hormone is supposed to act through the medium of the ovary, in which it brings about rapid growth of the Graafian follicles and in the immature animal may induce a premature œstrus. The work of A. C. SIDDALL and of ZONDEK and ASCHHEIM, which was reviewed in THE LANCET last week, is based upon the experimental proof of the increase in amount of these hormones in the blood and urine during pregnancy. SIDDALL'S work depends on the presence of ovarian hormone in the blood of the woman whose pregnancy is to be tested. Her serum is injected daily in doses of 1 c.cm. into an immature virgin mouse for six days. On the sixth day the mouse is killed and weighed and the ratio of the weight of the whole mouse to the combined weight of the uterus and ovaries is estimated. If the ratio is less than 400 to 1 the test is regarded as positive. In 142 cases examined nine were erroneous. It is during the early months or weeks of pregnancy that the test would be useful in practice, so that it is noteworthy that in 19 tests on women less than three months pregnant only one erroneous result was recorded. ZONDEK'S test depends on the assumption that the anterior pituitary hormone is the activating factor. It is present in traces in normal urine, but according to ZONDEK the commencement of pregnancy is quickly followed by an explosive production of anterior pituitary hormone which is excreted in the urine. If samples of the urine from pregnant women are injected into young female mice in suitable doses, and the mice are killed in five days, their ovaries show hæmorrhagic centres and corpora lutea. This phenomenon is said to occur also when an extract obtained directly from the anterior portion of the pituitary gland is injected, but not when urine from males or non-pregnant females is injected. The results obtained by ASCHHEIM, using this method, are remarkable. Of 258 control urines examined, four were positive, whereas of 197 specimens of urines from pregnant women only four gave a negative result. The validity must rest upon the confirmation of these experiments by other workers. If some biological test unconnected with the genital system for the presence of anterior pituitary hormone could be devised, the fact that this hormone is the activating substance would be even more clearly demonstrated. The Zondek test is thus of the utmost practical importance and it seems probable that in the near future it may be developed into a standard test which can be carried out with little trouble in any laboratory equipped for biological work, with only a very small chance of error in the results.

AN ANACHRONISM.

CONDITIONS of life on the banks of the Tyne are out of harmony with the times in which we live; they are an unwelcome legacy of the Victorian industrial era, presenting us with a medico-social problem extremely difficult of solution. The object of Dr. MESS'S survey of Industrial Tyneside[1] is to set out the chief facts concerning the welfare of the inhabitants of either bank of the Tyne estuary, an area which embraces 11 municipalities—on the north bank Newburn, Newcastle-on-Tyne, Wallsend, and Tynemouth; on the south bank Blaydon, Whickham, Gateshead, Felling, Hebburn, and South Shields—to which have been added for the purposes of the inquiry Gosforth and Whitley & Monkseaton, both of which are adjuncts of Tyneside though not actually riparian. The report, which has been drawn up under the guidance of an advisory committee presided over by Sir THEODORE MORISON, covers in separate chapters the questions of population, industries, ship-building, coal, housing, health provision, education, organised religion, voluntary social service, and local government; and the inquiry may be compared in importance with that undertaken for East London some 40 years ago by CHARLES BOOTH and his collaborators. There is, however, an essential difference, which is that Dr. MESS brings to his task the equipment of modern social research and the outlook of one trained in exact observation and deduction, for his monograph on Casual Labour at the London Docks still counts as a model investigation of its kind. The sordidness of the picture he draws seems to be only too clearly justified by an unbiased use of figures. Out of the mass of relevant facts he is nevertheless able to crystallise the Tyneside situation into a few pertinent questions. Can it be generally known, he

[1] Industrial Tyneside: a Social Survey made for the Bureau of Social Research for Tyneside, by Henry A. Mess, B.A., Ph.D. London: Ernest Benn, Ltd. Pp. 184. 10s. 6d.

asks, that Tynesiders live in homes smaller by 30 per cent. or so than those in which most Englishmen live; that the elementary schools are worse staffed than those in other areas; and especially that tuberculosis in Jarrow takes a toll twice as big as that which it takes in an average English town of that size? The Tyneside which he deplores is the product of a long period of prosperity, in face of which the natural tendency would be to say that nothing can be done just now, that the district must carry on as best it can till better times arrive. But for Dr. MESS and his committee there is no salvation in that direction; if Tyneside waits for the good old times to come back it may wait for ever. A badly housed, badly educated population is likely to be a miserable population breeding recklessly; Tyneside cannot afford to have such social conditions as now exist. The chief factor in the situation is that these small industrial towns are for the most part one-class communities.

Sixty or seventy years ago, writes Dr. MESS, when these towns were self-contained communities, men and women of all classes lived in them; they had their local gentry, their leaders of industry, their professional men, as well as their mechanics and labourers. It is different to-day. The lord of the manor no longer lives in the Tyneside town from which he draws his ground rents, or from the sale of whose land his wealth is derived; he or his descendants live in pleasanter places, and their connexion with the town is slight. The directors, the works managers, the secretaries, the chief engineers, and the chief chemists disappear when their work is done to homes at a considerable distance. The professional men, and quite a number of the better-paid workers, do the same. And whereas a great city keeps the different classes, though widely separated geographically and psychically, within the unity of its borders, here the well-to-do leave the poor workers at the yard gate and go home to another town and perhaps to another county.

The first ameliorative suggestion in the report is that some men and women should of free choice make their homes in the meaner Tyneside towns for the sake of neighbourliness, at all events until marriage and the coming of a young family make this difficult. There seems little doubt that more than a few would be willing but for the objection, not dealt with by Dr. MESS, that any who did so would be taking up housing room in an already overcrowded district, making it more difficult for at least one poorer neighbour who must live near his work and within his means. The report next appeals to the sense of responsibility among those in the higher positions of big industries. Useful welfare work may be done by one or other of these, but what the Tyneside towns need is something in the nature of an institute, a settlement, or a folk-house, to which all and every may belong. And, thirdly, there is the urgent need of a new equilibrium between population and industry; it may be a question of emigration, of migration to newer coalfields, of greater mobility between occupations, or of creation of new industries. The immediate situation may be black, but some comfort is to be derived from the experience of the past, for Tyneside has survived other crises during the last century.

Turning to aspects which more immediately concern the medical profession, Dr. MESS suggests the provision of additional infant welfare centres in some of the towns and especially more antenatal supervision, for infant mortality is not only high on the average, but is curiously unequal in its distribution. Maternal mortality, on the other hand, is definitely low, for it is a bright spot in the situation that so few married women leave their homes for industry or commerce. More institutional accommodation is required for advanced cases of tuberculosis in view of Jarrow's disturbing record of a death-rate from tubercle as high as it was 30 years ago. Nor have Gateshead and Wallsend yet recovered their pre-war position. More accommodation in local hospitals for cases of pneumonia would save many lives. The special hospitals in the district do valuable work, but are imperfectly related to each other and to the general hospitals, while the facilities for isolation are obviously deficient, and the poor-law hospitals are unable to classify their cases as they should. There is general testimony to the need of additional convalescent accommodation. While it may be necessary to wait for the initiation of large social changes, there seems no reason why it should not be possible even now to set up a permanent hospital council for Tyneside, the duties of which would be to review existing provision, to secure coördination by eliminating waste, and to endeavour to fill such gaps as have been shown to exist. Better still, perhaps, might be a council of broader scope, not restricted to the coördination of medical services alone, an urban counterpart of the rural community council. On Tyneside it is nobody's business to know what social agencies exist; there is no systematic attempt to train social workers. What is required is a recognised clearing-house to cover every side of social need. Reference to a handbook [2] just issued will show the many directions in which coördination is being attempted elsewhere. Something of this sort might bring Tyneside into the picture of the twentieth century.

THE WELFARE OF THE DEAF.

THE National Institute for the Deaf has, we are informed, received from an anonymous donor the sum of £5000 (consolidated 4 per cent.) to be applied in the promotion of the national objects of the institute. There are some 40,000 persons in Great Britain who have been deaf from birth or very early life, and the urgent need of larger provision for their welfare was clearly set forth at the annual meeting of the National Institute held in July last,[3] when Lord Charnwood, the Duke of Montrose, and Dr. F. E. Fremantle, among others, pointed out the grievous loss to the State, if only from the economical point of view, arising from inadequate provision for the deaf, and a resolution was passed calling upon the Government to deal with the matter at an early date. It is 40 years since any Government department has made an inquiry into the position of the deaf. The National Institute for the Deaf, which has been in active operation for only three years, has during that period done a great deal of useful work in spite of the fact that its hands are tied by lack of adequate funds, the ordinary income being insufficient to meet expenses. It is the only body competent to make a national survey of the many problems of deafness—our readers will note an appeal for information in our correspondence columns this week—and to initiate the necessary reforms, and we trust that other generously minded people will realise the urgent need for looking after our deaf population, and will follow the good example here recorded. The address of the National Institute is 2, Bloomsbury-street, London, W.C. 1.

[2] Voluntary Social Services: a Handbook of Information and Directory of Organizations. London: National Council of Social Service, 26, Bedford-square. Pp. 198. 2s.

[3] See THE LANCET, July 21st, p. 155.

Annotations.

"Ne quid nimis."

RHEUMATISM AS A NATIONAL PROBLEM.

THE recent meeting of the International Society of Medical Hydrology, which took the form of a roving commission through the various British health resorts, may well be a landmark in the history of spa treatment. It was not only that foreign delegates in great number were introduced to an admirable variety and wealth of hydrological equipment under the most pleasant conditions of weather and company, but that the resorts themselves must have had brought home to them a salutary sense of being part and parcel of a national and international movement. At each stage of the journey subjects of great medical interest were discussed by clinicians of European reputation, and plans made for further study and research. In one direction these prospects seem likely to be realised within the near future, for at Buxton on Oct. 15th an International League against Rheumatism was duly constituted. It was there that Dr. Zimmer, representing the German group, pointed out that the incidence and cost of rheumatic diseases throughout the German Republic constituted a blot on the national life more serious than tuberculosis itself, and the reports from nine different European States, read at this meeting, expressed the same feeling in different ways. In the prevention and treatment of tuberculosis everyone now recognises the value of an organised campaign and the justification for State aid, but although the Bath Conference of May last ranged over a very wide field of medical and social problems in regard to rheumatism, it produced no immediate result in the form of a concerted movement for dealing with these problems. Speaking for the General Federation of Trade Unions, Mr. W. A. Appleton stated at Buxton that 18,000 weeks of treatment, with consequent loss of working time to the community, were imposed by the rheumatic diseases on any group of 100,000 trade-unionists. Any reduction in this great mass of invalidity would save the resources of approved societies and secure an increased working balance on insurance funds. It seems not unreasonable therefore to suggest that some of the cost of treating and preventing rheumatism should be regarded as one of the contingent liabilities for which the reserve fund of the approved societies has been built up. The question of financial support from the State is exactly parallel to the case of tuberculosis. With this large policy in sight the British Subcommittee on Rheumatism has done well to follow the example of the continental States by re-forming itself on a wider basis as a national committee or society for organising research, control, and treatment of rheumatic diseases. We understand that the first meeting of this committee will be held on Nov. 7th, when it is hoped to have full official representation. After that it should not be long before every county has its rheumatism officer and every great centre of population its rheumatism clinic.

CURRENT PROBLEMS IN TUBERCULOSIS.

THE annual conference of the National Association for the Prevention of Tuberculosis, which is usually held in July, was postponed until October this year in order to facilitate the presence of transatlantic colleagues who had been attending the conference of the International Union against Tuberculosis at Rome. For this reason the conference in London had more than usual importance, which was reflected in the choice of subjects for discussion. The first day was devoted to a conference on tuberculosis among primitive peoples, and the second to the principles underlying antituberculosis schemes in any country. A report of the discussions finds its conclusion on p. 865.

The lessons of the conference may be summed up in Prof. S. Lyle Cummins's remark that within a few generations we should either be guilty of the deaths of numbers of subordinate people from preventable disease, or else provide them with working conditions consistent with their health. There would seem to be little doubt that all civilised nations have now awakened to their duties and responsibilities in this matter. The Health Organisation of the League of Nations, too, whose work in all branches of preventive medicine deserves to be more widely known than it is, is fully alive to these questions. Between the completely unprotected aboriginal and the well-salted European there appear to be many stages of partial immunisation. The older civilisations of the East, for instance, possess an amount of immunity which is by no means negligible, whilst Dr. R. G. Ferguson, of Saskatchewan, related to the conference how tuberculosis among the Indians of the great Canadian plains was gradually assuming a more chronic character. In South Africa, too, a considerable degree of adaptation and resistance has been now reached, thanks largely to efforts made amongst its native workers by the gold-mining industry. The stages of this immunisation have been marked, not by finding a therapeutic remedy for tuberculosis or by any prophylactic vaccine or serum, but by the patient efforts of preventive medicine directed by the men on the spot. Prof. Cummins described, for instance, how the dark overcrowded compounds of the workers, perhaps no worse than the native kraals but disease producing nevertheless, have given place to a new type of compound with a generous allowance of air-space and ventilation. It is perhaps not too much to hope that the purdah system of India, to which Dr. A. C. Lankester attributed a large responsibility for tuberculosis in that country, will in due time give place to a healthier environment for Indian women. But there is still a vast amount of acute and generalised tuberculosis amongst the unprotected people of the world which for pathologists and immunologists throws a flood of light on infectivity and resistance, on initial infecting dose, and on portals of entry—first a period of complete generalisation of infection in adults, such as is seen in the generalised tuberculosis of the infant in Europe, and later a less acute form comparable with the adolescent tuberculosis of Europe, until slowly the age at death shifts to the later years, a sign that immunising forces are beginning to take effect.

In the second day's discussion at the conference on the principles underlying the antituberculosis campaign, two points were stressed by Sir Robert Philip—namely, the great frequency of childhood infection and the importance of after-care; "once infected the individual," he said, "may, and often does, remain under the influence of infection all his days." To these might be added a third factor, which does not appear to have been emphasised as heavily as it might—namely, the importance of the chronic pulmonary case which is to all intents and purposes a carrier. Early diagnosis is doubtless of vast importance, but we must face the fact that modern methods of treatment have lengthened the life of the chronic phthisic, and in lengthening life have indirectly often lengthened the period of his infectivity. Of all the questions of preventive medicine which harass the tuberculosis physician to-day probably this is the most difficult, what to do with his case of chronic pulmonary tuberculosis who becomes afebrile and able to, and desirous of, returning to the outside world of human beings, but who still expectorates sputum containing tubercle bacilli. Finally, there are the questions of administration and control which were so clearly emphasised to the conference by Dr. G. Lissant Cox, of the Lancashire County Council. We wish it were possible, as he suggests, to make a regional survey of tuberculosis in this country on the lines of the illuminating survey made at Framingham in America. The financial side alone seems insuperable at present, at any rate for any survey on a large scale. But this should not dis-

courage the individual worker. If example is better than precept, the valuable work done on the lines of social inquiry on Tyneside during the last few years may be quoted as encouragement.

HOSPITAL EXPENDITURE.

THE Statistical Report[1] for the year 1927, just issued by the Economy Committee of King Edward's Hospital Fund for London, will be found indispensable to all who are concerned with hospital management. As we are reminded in a prefatory note, the annual statistical survey was begun by the late Mr. J. Danvers Power, who dealt in 1903 with 16 hospitals, but the early reports were circulated privately as they contained confidential matter. The first public report appeared in 1909, when figures were given for 66 hospitals. In 1910 the report was extended to cover 99 hospitals, and in 1922, when an analysis of the general fund income was added to the report, which then included 113 hospitals. The present series began with last year's report which covered 134 hospitals, as against 136 this year. The number of hospital beds available in 1927 was 15,040, as compared with 13,640 in 1923, the average number of beds occupied being 12,430, as compared with 10,960. New in-patients numbered 212,100, as compared with 175,100 five years earlier, and for the same periods the new out-patients were 1,670,000 and 1,514,000 respectively. The total out-patient attendances in 1927 were 7,902,000 and 6,669,000 respectively. It should be noted that the total for 1927 does not include the out-patients at the Plaistow Maternity and Mothers' (Salvation Army) Hospitals, as early figures are not available for comparison. All this shows a steady increase in the volume of hospital work. The total income of these 136 hospitals for the year under notice was £3,241,000, as compared with £3,041,000 in the previous year, the increase being due in the main to donations, legacies, and receipts from patients, the latter totalling £66,000. It is satisfactory to note that the set-back in 1926 has been more than overcome, the 1927 figures recording a new high level in income. The report, which in an appendix contains figures relating to six infant welfare hospitals, is elaborately illustrated with graphs and diagrams which, generally speaking, make for clearness. A novel diagram is a medicine bottle showing the total general fund expenditure, and the proportion of this expenditure provided by income from investments and by receipts for service during each of the five years 1923–27, an uncoloured portion of the bottle illustrating the gap which needs to be filled by voluntary gifts. In 1927 the expenditure on London voluntary hospitals was rather more than £8500 a day, to meet which something over £4000 a day must be raised by gifts.

THE WISDOM OF PETER HARDING.

SOME years before the late war Dr. Peter Harding wrote a series of letters from "the corner of Harley-street," which ranged wittily over a variety of subjects—fishing, the leanings towards quackery of an old aunt, the teaching of sexual matters to the young, education, and modern journalism, and above all the worries, the pleasures, the rewards, the duties and the glories of the medical profession. We recognised at the time that in these letters Dr. H. H. Bashford, as we now know him, had written a remarkable manual of wise professional conduct. In one letter he recognises with great sympathy the descent for the young physician from holding the office of house physician or surgeon to being a young general practitioner, shorn of the panoply of office and presenting himself as a visitor—probably an unwelcome visitor—in unfamiliar circumstances. Many a man in the early stages of his employment, when he is likely to feel both naked and ashamed, will find counsel and support in the letters of Peter Harding. More shrewdly than most writers he estimates the qualities which distinguish the successful practitioner; he may not be able to excise a Gasserian ganglion, he may not know very much about the researches of Calmette or Pirquet, but he does know precisely when to call in the men who do. When sickness comes to the average household it touches nearly every department of domestic economy, and upon a hundred points other than that of pure medicine the general practitioner is the trusted adviser. His patients and their friends do not appeal to him definitely either as a moralist, as a sanitarian, or as a wizard; they are simply involved in terrible complications, and they call upon him in a general manner as a very present help in time of trouble. Peter Harding's letters, now republished in a cheap and handy edition,[1] have not lost in value with the intervening years of strife which have put so many of the old prudential considerations out of date. The "blobs" and "half-masters" which distinguish his adolescent girls are no more, but the advantage of abstinence from butterscotch over the wearing of a flannel cholera belt, the counsel to the aunt to rub a few drops of turpentine over the spot rather than take the pills which so well suited one of her friends, are as topical as they were; and the interview with a young journalist in Chapter XXII. might have been written for situations which have since led to ethical disaster. The book is pervaded with a humour, whimsical rather than mordant, which should help the reader to face alike the tragedy and the pathos of professional life. No novice can read Peter Harding's letters without gaining an insight into the actions and reactions of practice which should enable him to begin to form a philosophy of professional life. No practitioner of experience who lives in this spirit will need to blunt his perceptions or to soothe his sorrows with artificial anodynes. Peter Harding will, in fact, if taken to heart, enable him to falsify the picture of professional life recently sketched in lurid colours at the Institute of Hygiene.

INFECTIOUS DISEASE IN IRELAND.

IN an address on the epidemiology of Ireland, published in the *Irish Journal of Medical Science* for October, Sir John Moore says that the first recorded pestilence in that country was chronicled by the Four Masters as taking toll of 1000 people in a single week in the year 2820 A.M. (Septuagint chronology). Their burial-ground or Tamhleacht (literally, the plague monument) can be traced in the town now called Tallaght, near Dublin. Bills of mortality in the capital date from 1682, and valuable epidemiological observations began to appear early in the eighteenth century. Among the outstanding writers were Joseph Rogers: "Essay on Epidemic Diseases," 1734; John Rutty, "A Chronological History of the Weather and Seasons, and of the Prevailing Diseases in Dublin, with their Various Periods, Successions, and Revolutions, during the space of Forty Years," 1770; and James Sims, "Observations on Epidemic Disorders, with Remarks on Nervous and Malignant Fevers," 1773. The epidemic diseases discussed were "influenza," "fever," "small-pox," "dysentery," and "epidemic angina maligna." This last was diphtheria, and it is probable that "dysentery" was often enteric. The severe frost of 1739–40 destroyed the potatoes and caused famine, which ushered in a calamitous train of dysenteries, malignant fever, small-pox, and scarlatina maligna, as well as an "unparalleled epizoötic affecting sheep and horses." It is supposed that 300,000 people perished. Thrice in the nineteenth century did cholera visit Dublin; in 1832 it carried off 5632 persons, in 1849 the victims numbered 30,156, and it appeared again in 1866, when Sir John Moore was a medical student. In the Registrar-General's report for August 26th, 1865,

[1] London: Spottiswoode, Ballantyne and Co., Ltd. 108 fcap pages. 2s. 6d.

[1] The Corner of Harley Street. By H. H. Bashford, M.D. London: Constable's Miscellany, No. 26. Pp. 271. 3s. 6d.

are the words: "I suggest that this would be the time for (sanitary) inspection from house to house; for if (cholera) breaks out in the neglected tenements of the poor, it will, no doubt, attack the inhabitants of the better houses which may happen to be in the neighbourhood of the tainted atmosphere." Exactly seven months later the first death from cholera was recorded and the epidemic did not cease until it had destroyed 1459 citizens of Dublin in 22 weeks. Typhus has not troubled the island since the great famine epidemic after the failure of the potato crop in 1846, and although terrible epidemics of small-pox occurred in 1871, 1878, and 1894, and a small outbreak in 1903, only one death from this cause has been registered in the whole country during the last quarter of a century. No conscientious objection to the Vaccination Acts is recognised in Ireland. Sir John Moore passes, in this Presidential address to the Epidemiological Section of the Royal Sanitary Institute, from the historical epidemics to the happier theme of the growth of sanitary science, a movement which is mostly contained within his lifetime and in which he has played a distinguished part. A diploma of State Medicine was instituted in 1870, and in 1872 the Dublin Sanitary Association was formed. The first Irish Public Health Act, passed in 1878, consolidated a score of minor measures already in force. After praising famous men and women who laboured to accomplish all that has been done, he concludes by speaking of the five infections still rife—measles, scarlatina, diphtheria, pneumonia, and epidemic diarrhœa—and to the ever-present problem of housing and slum clearance. Every friend of Ireland will hope with him that she may soon learn how to deal with these enemies of her peace.

THE RISKS OF INDUCING PNEUMOTHORAX.

THE risks attending the induction of artificial pneumothorax are small, and, as was once more made evident in the discussion reported on p. 867, in properly selected cases the therapeutic value of the procedure is high. Much has been written on the dangers of pleural shock, but this is a complication that may result from any form of pleural puncture, and one more likely to be encountered in the later stages of treatment than at the time of the primary induction. Details of technique are of the utmost importance if untoward sequelæ are to be avoided, and Dr. R. R. Trail's suggestion that facilities should be offered to practitioners to study the exact proceeding used in sanatoriums deserves attention. The dangers of gas embolism are negligible if a trocar similar to that invented by Dr. Clive Riviere is used and if the air is allowed to enter the pleural cavity under the influence of its negative pressure alone. Surgical emphysema is usually regarded as a minor accident, and seldom causes distress to the patient or anxiety to the practitioner; but two cases published recently by H. Secousse, J. Caussman, and P. Lamothe[1] illustrate the grave danger that may attend the escape of air into the subcutaneous tissues. In the first of the two cases described the attempt to induce pneumothorax was abandoned after two punctures, no free pleural space being found. Subcutaneous emphysema was noticed a few hours after the punctures had been made, and next day the condition spread to the face, neck, and arms. Despite treatment by multiple skin punctures the emphysema spread to involve the subcutaneous tissues of the whole body, including the legs and feet. The patient died of asphyxia four days after the onset of symptoms. In the second case, after three unsuccessful attempts to find free pleura had been made, a fourth trial led to the discovery of a pleural pocket into which 100 c.cm of air was passed. A rapid rise in pressure was noticed, the patient complained of pain, and the operation was abandoned. Subcutaneous emphysema was noticed on the evening of the same day, and on the morrow this had spread to involve the whole tho face, and arms. The condition gave rise to acute p During the following week the emphysema gradu subsided. The common cause of subcutane emphysema following artificial pneumothorax is escape of injected air from the pleural cavity by of the track of the needle and the resulting emphys is usually limited to the environs of the punct In the two cases reported it is obvious that the es of pulmonary air was responsible for a condit causing serious distress to one patient and the de of the other. An adherent and rigid pleura was pre in each instance. The needle passing through punctured the lung and the track remained pa owing to the lack of normal elasticity; thus with e expiration air was forced into the subcutaneous tiss Accidents of the nature described are fortuna rare, but the possibility of a similar mischance sho be kept in mind, especially when physical signs radiographic appearance indicate a thickened probably adherent pleura. If care is exercised avoid "silent" areas and to limit the depth of punct the risk of penetrating the lung is not great. S risk is materially lessened by the use of a needle of Riviere type, and will be still further reduced i careful technique be adopted to ensure so far possible the closure of the puncture track. This n be accomplished by keeping the skin flat at moment when the needle is withdrawn, and by apply a pad over which pressure is exerted by the patie arm for a few minutes after the operation. Sho any danger of extensive emphysema arise the auth suggest the subcutaneous insertion of Southey's tu A more drastic remedy is that practised by Berang who in a case of surgical emphysema exposed trachea and inserted drainage-tubes into the surrou ing tissues to permit the escape of effused air.

[1] Archives Médico-Chirurgicales de l'Appareil Respiratoire. 1928. Tome III., No. 1.

THE ROCKEFELLER FOUNDATION AND MEDIC EDUCATION.

ALTHOUGH the work of the international hea division is probably the most important of Rockefeller Foundation's activities, especial attenti will be given in this country to the section of annual report which deals with medical educati Visits have been paid by the staff to educatio institutions in many countries and promin "medical educators" have visited Canada and United States as guests of the Foundation duri 1927. Fellowships in medical education have prov a valuable part of the work of the Foundation, bei awarded by preference to young physicians connect with hospitals or schools with which the Foundati is already coöperating. On the recommendation their teachers and with the promise of assured positio in these institutions on the termination of th Fellowships these men take their country's point view to foreign schools and bring back a new outlo that will help in their career as instructors and inves gators. Excluding certain special grants to Fello from China, the Foundation awarded 111 forei Fellowships in 1927 and continued to support t Fellowships administered by the Medical Resear Council in this country for study in the United State The programme started in 1925 for recruiting t ranks of teachers and investigators, by assisting in small way departments which are active in attractin and training young medical graduates, has bee carried on. Aid in furnishing laboratory supplies an emergency measure in Europe after the war w discontinued at the end of 1926. In 1927, howeve a new programme was undertaken to help re-establishing returned Fellows by providing the with necessary laboratory supplies for going on wit work along the lines laid down whilst they hel Fellowships. Grants to aid in the provision of medic literature are gradually being diminished in view of decreasing need for such assistance, but in 192 literature was still supplied to as many as 260 instit tions in 19 countries. Under the heading of aids t

medical institutions the report of the Foundation describes some of its biggest individual efforts. At Lyons there is to be a contribution towards the purchase of land and the cost of construction of a building to house the Faculty of Medicine and Pharmacy, next to the site of the large new hospital which the municipality has been building. At Tokio, the Keio University Medical College has received funds to provide an earthquake- and fire-proof building and for equipment for new laboratories of hygiene and parasitology, whilst another new undertaking in 1927 was aid to the National School of Medicine and Pharmacy at Port-au-Prince, Haiti. In this country the work of the Foundation is of course well known. The help given to the London Hospital and Medical School for the unification of the pathological laboratory and other laboratories of the hospital made it possible to open new buildings not long ago, and at University College the Foundation has provided endowment for the increased maintenance costs in the departments of anatomy, physiology, and pharmacology.

A CENTENARY AND A CONGRESS IN EGYPT.

THE Kasr-el-Ainy Hospital is one of the many legacies of Napoleon's adventure in Egypt, for it was converted from a palace into a hospital in 1798 by his director of medical services, the famous Baron Larrey. Rebuilt in 1812, it later became the first Government medical school in the country, and the centenary of this school, to be celebrated in December, will be an event of importance to Near Eastern medicine, because King Fuad will then lay the foundation-stone of new buildings on Roda Island. These will comprise a hospital of 1500 beds, and large schools of medicine, dentistry, and pharmacy constructed to the plans prepared by Messrs. Nicholas and Dixon-Spain of London. This immense medical centre is the first item of the Egyptian Government's programme for increasing hospital accommodation, and the centenary celebrations will gain in prestige and interest from the presence in Egypt of an International Congress of Tropical Medicine and Hygiene which is to meet in Cairo from Dec. 15th to 22nd. This congress promises to be exceptionally successful, for nearly 1500 members have already arranged to be present, and there will be a full week of scientific meetings. At its conclusion members will be able, if they wish, to spend Christmas at Luxor under conditions which are described as ideal, and we learn that they will benefit by substantial reductions in steamer passages, railway fares, and hotel charges. The arrangements for travel and excursions have been entrusted to Messrs. Thomas Cook and Son, to whom application may be made at their various offices; or, if so desired, the committee will undertake this work for members. The secretary-general is Dr. Mohammed Khalil, who may be addressed at the Faculty of Medicine, Cairo.

DIABETES AND PREGNANCY.

REVIEWING the results of treatment for diabetic women who have become pregnant, Mr. A. L. Walker [1] says that 19 cases of diabetes mellitus with pregnancy have been described during the last six years. This shows that the condition is very rare, but it is none the less important, if only because the recorded cases give a good idea of the value of insulin. Before this substance was available Whitridge Williams collected a series in which 18 out of 66 patients died during pregnancy, labour, or puerperium—a mortality of 27 per cent. Insulin seems to have changed the outlook altogether, for Walker states that only one of the 19 recent cases was fatal, and she had suffered from a severe toxæmia of pregnancy. Furthermore, only two of the other patients seem to have lost ground during their pregnancy, and one of these got better again later. The figures for the children also show considerable improvement on the mortality of 41 per cent. recorded by Whitridge Williams. If we add to Walker's series the case which Dr. N. M. Goodman reports on p. 862 of our present issue, we find that the 20 women had 23 pregnancies, and that 17 children were born alive. There were four stillbirths and one woman had two miscarriages, so that the total mortality of children was only 26 per cent.

These results are so good that the inference might be drawn that a diabetic woman runs little risk in becoming pregnant, and Goodman's case shows that the issue may be satisfactory under conditions which would be considered unfavourable. But this inference would be wrong, for conception always exposes the patient to the risk of developing some complication during the pregnancy, labour, or puerperium. If the diabetic woman gets any complication she will need more insulin; she may be in grave danger of her life unless the dose is rapidly increased, and on recovery she may require more insulin than before. Nevertheless, provided the patient and her husband know the risk which is being run, there is no reason why the pregnancy should not be permitted. In considering the treatment to be adopted it may be noted that in two cases the child was delivered by Cæsarean section so as to sterilise the woman. The question whether sterilisation should be performed must be very carefully considered, and it should only be done at the explicit request of the patient and husband. Both male and female diabetic patients often ask whether it is certain that a child born of a diabetic parent will be a diabetic. So far there are no data available to answer this question, and it is only possible to express the opinion that it has a greater chance of developing diabetes than a child of a non-diabetic parent, though it does not follow that it will do so. None of the children of Mr. Walker's series had any signs of diabetes at birth, and so far no accounts of their fate have appeared. The various authors who have reported these cases should certainly report any future developments so that facts may be available instead of impressions.

[1] Jour. Obst. and Gyn. Brit. Emp., 1928, xxxv., 271.

HALLOWEEN, 1828.

ALLHALLOWS Eve marks one of the most ghastly of medical memories, for it was on this night a hundred years ago that Burke and Hare committed their last murder. Though the story has often been told,[1] the occasion demands a brief repetition. Burke and Hare had a short run of less than a year; 15 murders were committed without suspicion of foul play, but the sixteenth was brought to light, and they and their accomplices were arrested and tried for their lives. Hare and his wife turned King's evidence, Burke was hanged and dissected. The murders began in this way. On Nov. 29th, 1827, an old army pensioner died in Tanner's-close, West Port, Edinburgh. He was in debt to his landlord, Hare, to the amount of £4. Hare decided to reimburse himself by selling the body. It was removed from the coffin and a bag of tanner's bark substituted; after the funeral of the bark Burke and Hare went to the University intending to bargain with Monro (tertius). While they were inquiring for Monro's rooms one of Knox's students happened to pass by and suggested that they should try Knox's rooms at 10, Surgeon's-square. This they did, and Knox bought the body for £7 10s. Here was an easy way of making money; too lazy to undertake the hard work of the resurrectionist, and finding it tedious waiting for another natural death at home, Hare suggested enticing the aged and infirm into his house and doing them in. Their first case was an old woman market-fresh from Gilmerton, near Edinburgh. Hare got her into his den, gave her more whisky, and when she was dead drunk, he placed his hands firmly over her mouth and nose to stop respiration, while Burke laid himself across her body to ensure stillness. The body brought £10.

[1] See, for instance, a leading article in THE LANCET, 1921, ii., 190.

Encouraged by the success of the experiment, Burke and Hare lured into their houses widows, orphans, street-walkers, and imbeciles, made them drunk and suffocated them. Daft Jamie and bonny Mary Paterson were well-known Edinburgh characters, and the fact that the bodies were often warm when delivered at the rooms does not seem to have aroused any suspicion. Their last victim was a woman named Docherty, who was invited to partake of the revels of Halloween, and when drunk was murdered in the usual way. Next morning her body was seen by two lodgers under some straw, and the police were informed. We need only refer to the abuse which was showered on Knox and his assistants; the press of the day roundly asserted that they knew too much, and called for an inquiry into the whole matter of the bodies dissected at Knox's rooms during the past year. Although this odium now appears to have been entirely undeserved, Knox's career as a great teacher of anatomy was practically over. His assistants, the chief of whom were Wharton Jones, William Fergusson (later Baronet and President of the Royal College of Surgeons), and Alexander Miller, shared in the abuse. We have Sir Rickman Godlee's authority for stating that Wharton Jones felt the reproaches most keenly; it was a tragic period of his career, and he never alluded to it in after life if he could help it. The passing of the Anatomy Act of 1832 was the outcome of these villainous murders. The whole country was roused to frenzy. The Government, though often urged by responsible persons to do so, had up till then resolutely declined to make any provision for the teaching of anatomy. But the Burke and Hare murders led to the crisis which, four years later, was settled for good and all by an Act of Parliament.

SUBSCRIBERS and donors to the Royal Medical Benevolent Fund are asked to forward their subscriptions for the current year before Dec. 31st. Not only the scope of the Fund's work but also the amount of assistance given depends upon the subscriptions received, and in view of the many cases in which help is greatly needed, especially during the winter months, an urgent appeal is made for donations. The work which is being undertaken is illustrated by a brief report appearing on p. 856. Cheques may be sent to the hon. treasurer at 11, Chandos-street, Cavendish-square, London, W. 1.

DONATIONS AND BEQUESTS.—As a memorial to her late husband, Dr. Filippo G. Melandre, who worked for 35 years on the hospital staff, Mrs. Melandre has provided an installation of an X ray apparatus for the new X ray department of the Italian Hospital, Queen-square, W.C., at a cost of £1000.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—At 5 P.M. on Monday, Oct. 29th, at the rooms of the Medical Society of London, 11, Chandos-street, Cavendish-square, W., Mr. C. S. Lane-Roberts will give a lecture on Abdominal Pain in Pregnancy. On Tuesday, Oct. 30th, at 2 P.M., Mr. Lionel Colledge will give a clinical demonstration at the Hospital for Diseases of the Throat, Golden square, and on the following day, at 4 P.M., Dr. S. H. Daukes will give a demonstration on Diet and Disease at the Wellcome Museum of Medical Science, 33, Gordon-street, W.C. No fee will be charged for admission to the lecture or demonstrations. On Monday, Oct. 29th, a practitioners' course in medicine, surgery, and the specialties, lasting a fortnight, will begin at the Hampstead General Hospital. It will consist of a demonstration and lecture daily from 4.30 to 6 P.M. Other courses which have been arranged are as follows: Medicine, surgery, and gynæcology, at the Royal Waterloo Hospital, Nov. 12th to Dec. 1st; neurology, at the West End Hospital for Nervous Diseases, daily at 5 P.M., Nov. 19th to Dec. 15th; ophthalmology, at the Royal Westminster Ophthalmic Hospital, Nov. 12th to Dec. 1st; proctology, at St. Mark's Hospital, Nov. 12th to 17th; urology, at St. Peter's Hospital, Nov. 19th to Dec. 1st; venereal disease, at the London Lock Hospital, Nov. 5th to Dec. 1st. Syllabuses and particulars of post-graduate work may be had from the Secretary of the Fellowship at 1, Wimpole-street, London, W. 1.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CCLXXXVI.

THE TREATMENT OF GASTRIC AND DUODENAL ULCER AFTER SUBSIDENCE OF ACUTE SYMPTOMS.

THE treatment of peptic ulcer at the time when the patient first seeks advice on account of its manifestations has already been dealt with in this series, and some indication has been given as to the method of treatment at a later date. It is a common experience that a very little trouble is sufficient to allay the outstanding symptoms of this disease, but it is frequently found that patients relapse in spite of the apparent success which followed their original treatment. If a case of gastric or duodenal ulcer is to be successfully treated, it is clearly necessary that the patient shall not only be freed from pain, hæmorrhage, or any other symptom, but that he shall be kept in good health subsequently. One of the outstanding features of this common disease, or diseases, is the periodic nature of its exacerbations, and it is exceptionally rare to encounter a case in whom attacks have not occurred for several or many years previously.

Careful inquiry into the history still further elucidates the fact in the majority of cases that between attacks a patient has had periods of complete good health. Bearing this in mind, no physician is justified at a time when this patient has been rendered free of symptoms for some weeks in imagining that he is cured, or, indeed, anything like cured. If permanent cure is sought, it is precisely at this period when the patient has been free of all symptoms for several weeks or months that curative treatment must be most actively pursued.

The stomach and duodenum could almost be described as silent organs, for there is little doubt but that they will function without the production of any abnormal symptoms at times when in reality they are the site of considerable anatomical change. In other words, the absence of symptoms is never any sure indication that the ulcer has disappeared, and it may be taken as an axiom that the presence of pain with gastric or duodenal ulcer is a late, and not an early, manifestation of the disease, and similarly that the disappearance of pain is an extremely misleading sign if it is interpreted as indicating the healing of an ulcer. To secure permanent healing a four-fold plan must be followed. This includes: (1) periodic review; (2) radiographic and laboratory control; (3) dietetic measures; and (4) treatment by drugs.

(1) *Periodic Review.*

The failure of many cases to avoid relapses is frequently due to the medical adviser not having impressed upon them the necessity for prolonged treatment, and is still more frequently due to a patient having neglected to follow sound advice when it has been given. Such failures can frequently be avoided by a re-survey of the case at regular intervals, at first mon[illegible] every three or six months. [illegible] est both of the patient and [illegible] ant that such periodic overhauls should take the form of a consultation. It must be remembered that these patients are usually in apparently good health, but that breakdown is likely to follow unless they are continuously encouraged and impressed with the necessity of prolonged care. They are the victims of a disease which only manifests itself at a time when it has become serious, and it must be made plain to them that to secure permanent healing of a gastric or duodenal ulcer is no less difficult a task than to secure the permanent healing of such a lesion as a chronic ulcer on the leg.

At the first re-survey of a patient whose acute symptoms have subsided particular attention should be directed to the elimination of focal sepsis. Until such potential causes of embolic trouble have been eliminated no one can claim to have taken the steps necessary to prevent recurrence of ulceration. It is frequently inexpedient to press drastic dental treatment on a patient at a time when there are effects of acute ulceration with risk of hæmorrhage and perforation, but as soon as his general health is more or less restored such treatment should not be postponed if indicated.

(2) *Radiographic and Laboratory Control.*

(*a*) *Radiographic Examination.*—Radiographic examination of the stomach and duodenum can be carried out first at six monthly and later at yearly intervals. It is to be remembered that the disappearance of an ulcer crater is not evidence of permanent healing, and that early ulceration will occasionally be invisible to the X rays. Complete absence of symptoms and of radiographic signs is valuable evidence of a negative character. The recurrence of symptoms or of radiographic signs which had previously been absent is positive evidence strongly in favour of recurrence.

In the case of duodenal ulcers of any real severity it is rare for the X ray evidence of anatomical deformity ever completely to disappear, but perfect health for an indefinite and comparatively permanent period is compatible with a considerable degree of scarring and permanent deformity in this situation.

(*b*) *Laboratory Examination.*—Examination of the stools for blood should be carried out at three monthly intervals after all symptoms have disappeared. It is unnecessary to put the patient on a special diet for this examination, but should occult blood be reported present, the patient should be put on a hæmoglobin-free diet for a few days and the examination repeated before significance is attached to it.

The above measures may well be made part of the periodic review and are of very great assistance not only for elimination of evidence of grave disease, but also as a means of impressing on the patient the necessity for patience and caution.

(3) *Dietetic Measures.*

It may be assumed that we are dealing with a case who has been carefully treated for three or four weeks on the lines indicated by Sippy—i.e., that he has been on 1-2 hourly feeds, largely consisting of carbohydrate and fluids, with a certain number of eggs, that he has begun to take a little fish once or twice daily, and that he is entirely free of symptoms. The diet of such a case for the next two years at least should be planned on the following lines. He will take three light meals daily, and the period between these meals will be broken by feeds to be taken at intervals of not more than two hours—i.e., he will take a light breakfast, a feed in the middle of the morning, and a light lunch not later than 1 o'clock, two feeds between then and a light dinner, which meal should not be later than 7.30 P.M. A final feed at 9.30—10 P.M. is appreciated by many patients.

Breakfast.—This may consist of one or two lightly cooked eggs, crisp toast or breakfast rusks, butter, honey, jelly, or jelly-like marmalade. Milky tea or coffee, one cup. A little porridge may be taken with advantage at breakfast if the patient cares for it, and cream should be taken either with this or in the coffee. If porridge is taken one egg should be sufficient.

Lunch.—Soup, either thick or clear, but not containing anything which would not pass through a coarse sieve is probably the ideal form of food for such patients. It is, however, not easily available in this country. Instead, for purposes of convenience, it is best to recommend a small helping of fish of soft character, cooked in such a way as not to deprive it of its softness, and to be taken with mashed potato. Mashed potato should not be the sodden abomination of the usual English restaurant or boarding-house, but should be made from floury potatoes, with plenty of milk and butter. It should have the consistence of thick whipped cream, and when properly made is delicious. The second course should consist of milk pudding, junket, or baked custard with cream and sugar.

Dinner should be on the same lines as lunch, but at this meal soup is almost invariably available. Its calorie value is increased by the addition of potato flour or other thickening, together with some butter or cream, and dry toast may be taken with it. Subsequent courses may be similar to those taken at lunch.

Feeds.—These may consist of milky coffee (usually the most popular), Horlick's malted milk, Ovaltine, Glaxovo, milky cocoa, tea and biscuits, egg and milk, or milk. Cold milk is well tolerated by some patients, but in others tends to produce trouble through the firmness of the clot. Citration of the milk will prevent this, but it may be less troublesome to use a substitute. The purpose of feeds is: (1) to increase the daily energy intake without having recourse to any large meal; (2) to diminish the acidity of gastric contents at times when it is tending to become high (*a*) by dilution of gastric contents, and (*b*) by adding a buffer solution which will neutralise acid. Feeds should, therefore, not be of a bulky character and for practical purposes should not exceed about 8 oz.

Increase and Change of Meals.—Any increase or change in meals should be carried out in accordance with certain definite physiological principles. *It is probably correct to say that the main function of the stomach is to secure liquefaction of the food before it passes on to the duodenum.* The treatment of peptic ulcer is designed to cut down the movements and acid secretion in the affected parts to a minimum, and this will largely be secured if the food is administered in a form which is already liquid or which will be liquefied with little effort on the part of the stomach. If the fluid is of highly nutritious character the necessary quantity will be smaller and a further advantage is thereby secured.

Applying the above principles, it must be borne in mind that the total daily intake of protein necessary for health is much lower than that which we are accustomed to accept, and palatability rather than purely metabolic considerations will decide the patient's requirements in this matter. At the end of six weeks he may begin to take a little meat; if it is minced it will pass the pylorus with less effort, but provided that he realises the principles underlying the treatment he can probably be trusted to mince it by mastication as thoroughly as will be accomplished by a machine. A lamb cutlet, a little chicken, or a little veal are the items usually first selected. One of these may be given at three meals a week at first, and subsequently at one meal daily. Soufflés are a form of food very useful in this disease and may be prepared with fish, cheese, or chocolate, and employed to give variety to the meals. The ingenuity of the patient, of his wife, and of his doctor should be called upon to help at this stage.

Forbidden Foods.—A list of forbidden foods is not very helpful, but is perhaps necessary. It includes the following:—

(1) Fruits, raw or cooked, with the exception of—

(*a*) Bananas, which can be taken mashed with cream and sugar.

(*b*) Orange juice, which can be given well sweetened.

(*c*) Stewed apple. This must be carefully prepared so as to be thoroughly soft and freed of all pips, skin, and pieces of core. The American name for this is apple sauce, which admirably conveys the nature of the prepared dish.

(*d*) A very little ripe soft fruit may be given at a later period, but only in the smallest quantities, and never more than once or twice weekly, being allowed solely on account of its palatability.

(2) Green vegetables and salads, raw or cooked.

It is doubtful whether raw vegetables, especially salads, can ever be permitted, even in the smallest quantities. No form of food appears to excite so much effort on the part of the stomach. As regards cooked vegetables, it must be remembered that few of them have any high calorie value, and they are, therefore, a form of food which is very wasteful in a patient requiring an easily digested diet of small bulk and high energy value. Mashed potato has already been mentioned as of great value. As regards other vegetables, the criterion as to whether they may be permitted should be whether or not they will

when served, pass through a sieve. Spinach, cooked in the continental manner and served with butter, is permissible occasionally, and other sieved vegetables may be employed to secure a periodic change.

Currants, raisins, &c., are clearly excluded from the diet by the above rule and, indeed, I know of no other means by which practitioner and patient alike can so readily decide whether a food is suitable or not. Bearing this in mind for the moment, it becomes obvious that such things as ice-cream, blancmange, custard, biscuits, sponge cake, and Madeira cake, can be granted in reasonable amounts, whilst such things as boiled puddings containing fruit, stodgy cakes, soups containing hard cereals or vegetables, stringy meat, and many other articles of diet are most undesirable.

(4) *Treatment by Drugs.*

Treatment by drugs is designed solely for the purpose of preventing any excess of hydrochloric acid in the stomach or duodenum. Belladonna and alkalis are the most useful preparations for this purpose.

(*a*) Belladonna, either in the form of tincture or of a solution of atropine sulphate, is the one drug which will actively inhibit the secretion of hydrochloric acid. To produce such an effect after absorption it must be given in doses which will tend to cause dryness of the mouth and dilatation of the pupil; if, however, it can be brought in contact with the gastric mucosa it will produce a local effect in very small doses, just as a lamella of atropine will produce dilatation of the pupil without any central effects. 5–7 minims of tincture of belladonna in half a tumbler of water can, therefore, be taken by the patient every morning on waking, and this easy form of medication should be continued for many months after the symptoms have ceased.

(*b*) Alkalis act by neutralising acid after it has been secreted. It is not yet certain what is the most useful combination of these preparations. The magnesia salts are probably the most active, but it has recently been shown that potassium citrate may be almost equally effective. Bismuth carbonate and prepared chalk are of far less value, but are sometimes useful as diluents when other salts are proving too relaxing in their action. The following prescription is useful:—

Magnesium carbonate heavy } āā grs. 20.
" " light }
Bismuth oxycarbonate }
A teaspoonful to be taken after feeds.

This, however, frequently proves to be strongly cathartic, in which case the proportion of bismuth must be greatly increased or potassium citrate and prepared chalk added to it.

A teaspoonful of some such preparation should be taken at a time when the acidity of the gastric contents is likely to be at its highest when two-hourly feeds are employed, the optimum moment is usually one hour after each meal or feed, and extra doses may with advantage be taken once or twice during the evening after the last meal.

Alkalosis is a definite danger, especially in patients with any chronic renal change, or with any tendency to pyloric stenosis. It is probably a wise precaution to stop the administration of alkalis for 48 hours once a month, and when there is any probability of alkalosis, the magnesia salts should be avoided altogether and preparations containing citrates or sodium phosphate substituted.

Tobacco and Alcohol.

(*a*) *Tobacco.*—It is widely believed that smoking is very deleterious for patients with peptic ulcer. Whether this is a nicotine effect, or whether it is in some other way connnected with cigarette-smoking it is impossible to say. It is, however, wise to persuade patients, whenever possible, to abstain completely from the use of tobacco.

(*b*) *Alcohol.*—The practitioner is invariably asked whether alcohol is permissible. There is no apparent reason why it should be completely prohibited. The best rule is to permit its use provided that the patient avoids: (*a*) all drinks containing really strong alcohol; and (*b*) all alcoholic drinks of a bulky nature. Thus, one glass of light red or white wine can be taken with meals during the later stages, and there is probably no harm in a patient taking a single glass of light beer or lager between meals in hot weather. When there is reason to suppose that such moderation will not be observed, it is clearly wiser to prohibit alcohol altogether.

Duration of Treatment.

At the present day it is impossible to say for how long treatment on these lines should be pursued. Several years is clearly the minimium period, and when the patient has been carefully trained by his practitioner, the observation of the régime outlined above for such a period offers no real hardship. The chief difficulty is encountered with patients whose business obliges them to travel extensively. When such persons are in town the multiplicity of tea-shops makes it easy for them to observe the rules, but when they have to travel between towns, or in the country, it is sometimes exceedingly difficult. Recourse must then be had to a pocket-flask containing milky feeds, or to biscuits and chocolate to be taken every two hours. It will further be found in such cases that the alkaline powder is very bulky and cannot be carried easily. The patient should be instructed to keep a bottle of the powder both at his home and at his office, and if these are not accessible, he should be provided with soft compressed tablets which will readily dissolve in the stomach and yet be portable. It is well here to emphasise the fact that to allow a patient to take grs. 5 or 10 of alkali after meals is a pious gesture the continuance of which may be avoided with benefit to everyone concerned.

Conclusion.

In conclusion, it is perhaps worth while drawing an analogy between peptic ulcer and diabetes. Both are dangerous diseases calling for prolonged and careful treatment. The dietetic indications in the two diseases bear no resemblance to one another beyond the fact that the régime of the patient suffering from gastric or duodenal ulcer is fully as difficult and important as that of the diabetic. It is beyond dispute that at the present day a relatively small proportion of our profession has grasped the importance of the dietetic treatment of peptic ulcer, and this fact bears some relation to the increasing number of such patients and the frequency with which dangerous abdominal operations are performed in the mistaken belief that effective medical treatment has been attempted and has failed.

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Physician to Out-patients, Middlesex Hospital.

UNIVERSITY OF LEEDS.—The annual report on the department of pathology and bacteriology of the University by Prof. Matthew J. Stewart and Prof. J. W. McLeod includes this year an abstract report by Prof. R. D. Passey on the development of the department of experimental pathology and cancer research. The staff of this department apart from the professor now consists of Dr. J. S. Young, assistant director; Mr. H. J. Channon, biochemist; Dr. Georgiana M. Bonser, Mr. G. H. Collinson, Ph.D., Dr. I. Berenbloom, and Dr. G. H. Shaw, Cancer Research Fellows; and Dr. Desirée M. B. Gross, part-time assistant. Prof. Passey reports that Lumby Hall and an estate of 21 acres have been taken over for a period of five years as an experimental farm. Prof. Stewart and Prof. McLeod record a large all-round increase in the number of routine investigations carried out by the staff of the department during the past year, and refer to 18 papers published from the department of pathology and bacteriology during 1927. Preliminary steps have been taken in the matter of preparing plans for the new pathological institute which is to be erected. At the request of the Leeds Board of Guardians Prof. Stewart prepared a new scheme for pathological services at St. James's Hospital, including the provision of a well-equipped pathological laboratory, and the services of a part-time qualified pathologist, and whole-time laboratory assistant. Dr. H. V. Phelon, a former member of the staff of this department, was appointed to the new post, and commenced work in June, 1927. At the same time he was appointed an honorary demonstrator in pathology in the University, and has since given valuable help in connexion with the museum tutorial classes. The opening of the new laboratory is part of a larger scheme for bringing the poor-law hospital of Leeds into the front rank of such institutions.

Special Articles.

EIGHTEENTH ANNUAL CONGRESS OF THE AMERICAN COLLEGE OF SURGEONS.

BOSTON, OCT. 8TH–12TH.

(FROM A SPECIAL CORRESPONDENT.)

THE eighteenth annual Clinical Congress of the American College of Surgeons was held in Boston from Oct. 8th–12th. This meeting was especially notable for the fact that Dr. FRANKLIN H. MARTIN (Chicago), its Director-General, and the man mainly responsible for its establishment, was for the coming year chosen its president. The services rendered by Dr. Martin to the cause of surgery, public health, and preventive medicine generally are known on both sides of the Atlantic, and the American profession are well aware of the benefits which he has conferred on them and the public by becoming the moving spirit of the American College of Surgeons. Already the College has brought reforms into the practice of surgery and raised the standard of hospitals throughout the United States and Canada.

MONDAY, OCT. 8TH.

The opening meeting of the Congress took place on Oct. 8th in Symphony Hall, Boston, in which 1500 delegates and guests listened to the opening addresses and saw the guests introduced.

An address of welcome was delivered by Dr. FREDERIC J. COTTON (Boston), chairman of the committee of arrangements, when Dr. GEORGE D. STEWART (New York), as retiring president, passed in brief review the work which had been done by the College during its existence, singling out for especial praise the raising of the standard of hospitals in the United States and Canada. He said that if all the other projects and undertakings of the College were to fail, the reforms introduced into the hospital system would always remain as an enduring monument to the vision and executive abilities of its chief founder.

The foreign guests were then introduced and among these were Dr. Daniel J. Cranwell (Buenos Aires), Sir Charles P. B. Clubbe (Sydney), Sir George A. Syme (Melbourne), Sir Charles Ballance, Mr. Thomas P. Dunhill, Sir Squire Sprigge, and Mr. G. E. Waugh (London), Dr. Percy T. Hughes (Bromsgrove), Dr. T. de Martel (Paris), Mr. Louis L. Cassidy and Mr. Charles J. MacAuley (Dublin), Prof. Vittorio Putti (Bologna), Dr. Rafael Reygades, and Dr. Ulises Valdes (Mexico City), Mr. Charles G. F. Morice (Wellington, New Zealand), Dr. Farquhar Macrae and Prof. Archibald Young (Glasgow), and Sir John Lynn-Thomas (Llechryd, Wales).

The inaugural address was then given by Dr. FRANKLIN MARTIN upon the Evolution of Medicine and Surgery in Relation to the Preservation of Health. The speaker dealt largely with the question of the degenerative diseases and predicted that the profession would soon be solving unknown problems that cause many unforeseen tragedies in middle life, and which foster the dread of death or of incapacity in old age. He pointed out that the degenerative diseases cause one-third of our deaths, while they are definitely influenced by ill-habits of life, over-strenuous mental activities, improper diet, and excessive use of stimulants, the factors that weaken resistance. Longevity, he said, would rise vastly with a general awareness of these things, while the degenerative diseases, the principal causes of senility, began at the age of 45, the most useful period of life, the sudden deaths in middle age being due to neglected conditions. Therefore he advocated periodical health examinations, which properly conducted by the family practitioner should reveal early beginnings of the degenerative diseases of middle life, when appropriate treatment should prevent or postpone their development. He pointed to the thorough physical examination of millions of soldiers in the Great War as proof of the value of scientific medicine, and as having convinced all thinking men of the wisdom of periodical scrutiny under the supervision of scientific medicine. Industrial and labour circles had now become impressed with the value of such examinations, and he traced the connexion between periodical examinations and the preservation of health which already was visible as a wholesome evolution in the practice of medicine. He concluded his interesting address by deploring the fact that the advances of science must leave many practitioners behind the times.

The last address on the evening's programme was the John B. Murphy Oration in Surgery delivered by Prof. VITTORIO PUTTI, with malignant bone tumours as a subject. Prof. Putti, speaking in fluent and eloquent English, after paying tribute to the memory of John B. Murphy as a pioneer in every branch of surgery and especially of bone surgery, pointed out that malignant bone tumours presented primarily a problem of diagnosis, the differentiation between benign and malignant bone tumour being difficult. There was nothing, he said, especially distinctive about the malignant type, while surgical intervention must be the sheet-anchor in treatment. He stated the opinion with decision that uncertainty in diagnosis, and consequent hesitation on the part of the patient, coupled with reluctance of the surgeon to undertake a mutilating operation, too often led to useless attempts at a conservative cure, when the loss of precious time took from the operation most of its chances of success. Dr. Putti expressed the hope that X rays had not yet exhausted their resources; the efficiency of operative treatment would increase step by step as early first manifestations of tumours were recognised and operations were undertaken without delay.

TUESDAY, OCT. 9TH.

On Tuesday evening, Oct. 9th, in the immense and crowded ballroom of the Copley-Plaza Hotel, a long programme was gone through.

The Hunterian Oration[1] was delivered by Sir SQUIRE SPRIGGE, Editor of THE LANCET, who pointed out that Hunter had been written about almost voluminously ever since his death, but who drew attention to the Hamilton letters, published in the early part of this year in THE LANCET, as throwing sidelights on the intimate life of both John and William Hunter from the work-a-day and social standpoints. A clear impression was conveyed of the practical genius who introduced such novel conceptions into physiology and pathology as to earn rightly the title of the "father of modern surgery." Speaking to the title of "Grand Curiosity" Sir Squire said that Hunter's many-sided investigations and observations, which had led to so great results, were all impelled by a consuming curiosity; with the spirit of a questioning child, Hunter demanded from Nature the why and wherefore of everything.

In a symposium on ureteral transplantations which followed, papers were read by Dr. ROBERT C. COFFEY (Portland, Oregon), Dr. CHARLES M. MCKENNA (Chicago), and Dr. ARTHUR H. CURTIS (Chicago), who dealt with the subject from various aspects of causation and treatment, while Dr. CHARLES H. MAYO (Rochester, Minnesota) spoke learnedly on the contributory causes of genito-urinary anomalies. Dr. GEORGE G. SMITH and Dr. WILLIAM C. QUINBY (Boston) took part in the discussion.

WEDNESDAY, OCT. 10TH.

Wednesday evening, Oct. 10th, was given over to a special meeting of the Boston Surgical Society for the presentation of the Henry Jacob Bigelow medal to Dr. CHEVALIER JACKSON, of Philadelphia, a pioneer

[1] The Oration appeared in full in THE LANCET of Oct. 13th, p. 739.

in bronchoscopy. With the aid of pictures on the screen, Dr. Jackson told the story from the beginning. The first work in bronchoscopy, he said, was done, under deflected sunlight, at the Massachusetts General Hospital in 1898, but the procedure did not become useful for the removal of foreign objects, or for the treatment of pathological conditions, until the use of artificial light in investigating the bronchi and trachea. Anything, he suggested, which can be introduced into the mouth can be swallowed or inspired, so that coins, nails and tacks, safety pins, teeth—natural and false—pieces of food, bullets, toys, little crucifixes, and parts of motor-cars had been removed from one or other passage at his clinics in Philadelphia. He emphasised the point that 90 per cent. of these foreign bodies were in those passages because of the carelessness of the public, and he showed numerous slides depicting both the peccant objects and the gross want of care on the part especially of mothers. He stated that since the establishment of alcohol prohibition there had been fewer cases of the swallowing of false teeth and of choking through swallowing large pieces of food, while evidence was coming in that bronchoscopy provided an effective aid to diagnosing certain forms of malignant disease, and was a useful mode of treatment of many ailments.

At the conclusion of Dr. Jackson's address he was presented with the medal by Dr. Harvey Cushing.

THURSDAY, OCT. 11TH.

On the afternoon of Oct. 11th, a symposium on cancer was held, when Dr. ROBERT B. GREENOUGH (Boston), chairman of the committee on the treatment of malignant disease with radium and X ray, read the report of the committee; Dr. JAMES F. PERCY (Los Angeles) read a statistical report of cautery surgery in uterine cases; Dr. GEORGE GRAY WARD (New York) dealt with radium therapy in carcinoma of the cervix uteri; Dr. WALTER E. SISTRUNK (Rochester, Minnesota) read a paper on the criteria of malignancy in cancer of the breast, and Dr. GEORGE W. HOLMES (Boston) discussed the results of X ray treatment of cases of cancer of the breast.

On the same evening Prof. ARCHIBALD YOUNG (Glasgow) read a report with comments thereon of two cases of chordoma, a malignant sacrococcygeal tumour and a tumour of the dorsal spine. The paper was illustrated with charts and photographs.

The next paper was read by Sir CHARLES BALLANCE, with the title Some Thoughts on the Nature of Cancer. He passed in review the experiences of a long professional career as bearing upon the investigations and observations of himself and others with regard to malignant disease from various aspects, and while speaking in hopeful terms as to the outcome of the researches of medical science in dealing with the greatest of disease problems, he deprecated the launching of campaigns to educate the public concerning its manifestations. In his opinion fright brought about by such means might be a contributory cause of cancer, as of other diseases. But he looked forward to the day when the now necessary operations and other curative and remedial measures applied to cancer could be supplemented by preventive measures, antitoxic treatment in the form of vaccine. A pleasing feature of Sir Charles Ballance's address was his complimentary reference to the earnest and honest work done by Dr. William Coley, of New York, in the field of cancer research and treatment.

Dr. GEORGE W. CRILE (Cleveland) then spoke on the adrenal factor in hyperthyroidism, in which he propounded a novel theory with regard to the relationship of the adrenal to the thyroid gland. Dr. FRANK H. LABEY (Boston) discussed the paper. Sir JOHN LYNN-THOMAS closed the evening's discussions by showing some interesting motion pictures dealing with orthopædic surgery.

On the evening of Oct. 12th, the convocation of the College of Surgeons was held in Symphony Hall, and proved a picturesque and imposing ceremony. Seven hundred surgeons from all parts of the United States, from the Far East, South America, and Canada, were admitted to fellowship, when honorary fellowships were granted to Sir Charles Alfred Ballance, Sir John Lynn-Thomas, Sir Squire Sprigge, and Sir George A. Syme, First President and Founder of the College of Surgeons of Australia.

The Presidential Address was then given by Dr. FRANKLIN MARTIN, who in stirring words sketched the history of the College. Dr. WILLIAM J. MAYO (Rochester, Minnesota) followed with an address on the right education of the surgeon, after which there was an informal reception of the new Fellows.

CLINICS AND AFTERNOON SYMPOSIA.

Various meetings were held during the busy work on the practical aspects of medicine. Hospital standardisation, in particular, was fully discussed, when it was found to be a general belief that in a properly standardised hospital all patients must have an accurate record made and kept of how the illness developed, of the diagnosis, treatment, and condition on discharge; while too much stress, it was thought, could not be laid on the attempt to make patients realise that the case-record is of so great importance to their proper care and welfare that they should coöperate with the authorities in every way possible for the purpose of securing the necessary information. The Board of Regents of the College of Surgeons approved the proposal of Dr. Frederic J. Cotton, chief surgeon of Boston City Hospital, that hospitals holding a place on the approved list of the College be required to "follow up" patients six months after treatment, keeping record of their recovery or failure to improve.

Clinics were held throughout the meeting at the various hospitals in Boston, and were largely attended. At one of these meetings it was stated that there are persons who have so much workmen's compensation, sickness insurance, and fraternal organisation benefits that their income is larger when they are sick than when they are at work, an obvious abuse for remedy, made possible only by the very fact that the medical profession gives its hospital services freely. During the meeting clinical demonstrations were held on the surgery of the eye, ear, nose, and throat. An important open forum and symposium on traumatic surgery was held in which the subject of industrial medicine and surgery was discussed from all angles. The principal clinics took place at the Massachusetts General, Boston City, Robert Brigham, Huntington Memorial, New England Deaconess and Children's Hospitals, and the Free Hospital for Women.

During the meeting Rear-Admiral Cary T. Grayson was elected President of the Gorgas Memorial Institute of Tropical and Preventive Medicine. Another interesting event was the presentation to the Massachusetts General Hospital of Boston by the Associated Anæsthetists of the United States and Canada of a bronze bust of Dr. William T. G. Morton, discoverer of ether. The presentation was made by Dr. F. H. McMechan, secretary to the Organised Anæsthetists of North America, in the dome room of the Massachusetts General Hospital which is kept as a shrine to the discoverer of ether.

At the annual meeting of the Fellows of the College, held at the Copley-Plaza Hotel on the afternoon of Oct. 11th, Surgeon-General Merritte W. Ireland (Washington) was elected President of the American College of Surgeons for 1929, and Dr. William W. Pearson (Des Moines, Iowa) and Dr. Perry G. Goldsmith (Toronto) were elected Vice-Presidents.

About 2500 Fellows of the American College of Surgeons attended the meeting, which from all points of view was a conspicuous success. The weather was delightful, the organisation was excellent, the clinical material was diverse and well selected, and the hospitality unbounded. To Dr. Franklin Martin, Director General of the College, and to Dr. McEarchen and Dr. Crowell, Associate Directors, all congratulations are due.

MINISTRY OF HEALTH.

ANNUAL REPORT OF THE CHIEF MEDICAL OFFICER, 1927.

Sir George Newman reviews the state of the public health in England under 14 headings. His introductory chapter deals with population, births and deaths, notifiable infectious diseases, sickness and invalidity. Sections follow on General Epidemiology, Tuberculosis, Venereal Disease, Cancer, Maternity and Child Welfare, the Insurance Medical Service, Relation of Food to Health and Disease, Medical Intelligence and Environmental Hygiene, Acute Rheumatism, Light Therapy, International Health and Health Education. He then summarises the record of 1927 with appropriate comments and supplies as appendices statistical tables and a list of the personnel of his department.

The principal facts concerning the physical life and health of the people in England and Wales during the year under review were the birth-rate of 16·6, the lowest on record; the death-rate of 12·3 per 1000, of which deaths 36·4 per cent. occurred under 50 years of age, and an infant mortality-rate of 70 per 1000 births, being the same as in 1926. The chief causes of death in order of mortality were diseases of the heart and circulation (201 per 1000 deaths), bronchitis, pneumonia and other respiratory diseases (157); cancer (111); diseases of the nervous system (90) and all forms of tuberculosis (79). These five conditions are together responsible for 64 per cent. of the death-rate, and it is against them even more than against the epidemics feared by our grandparents that battle has to be waged. It is impossible to compress all Sir George Newman's views and hopes for the improvement of the public health into small space, but it seems desirable to ascertain what he has to say as to the prevention and treatment of these devastating diseases.

PREVENTION OF DISEASES OF HEART AND CIRCULATION.

Acute rheumatism and syphilis are the diseases whose sequelæ are responsible for many of the deaths directly due to lesions of the circulatory system. It is pertinent to inquire what steps are being taken under the auspices of the Ministry to combat rheumatic infections and venereal diseases.

Acute Rheumatism.

Sir George Newman holds that a general compulsory notification of acute rheumatism would probably be impracticable at the present time in view of the difficulties of exact definitions, but that a valid case can be made out for the experimental trial of a system of compulsory notification for a definite period of years in selected districts where housing and other records are readily available, where an efficient machinery exists for investigating the cases notified, and where institutional accommodation can be obtained. These conditions are fulfilled in Paddington and Kensington, where acute rheumatism in children under 16 years of age is now notifiable.

The Paddington scheme of compulsory notification came into force on March 1st, 1927, but the Rheumatism Supervisory Centre at the Paddington Green Children's Hospital, under Dr. Reginald Miller, had been opened on Oct. 9th of the previous year, and Dr. Miller and Dr. M. Sanderson have published a report showing the working of the centre during the first year.

The number of cases dealt with was 175, of which six were judged to be definitely non-rheumatic; and of the remainder (169) only seven seem to have been notified under the compulsory notification system in force in Paddington, the rest being referred through the hospital, school medical service, or coming from adjoining areas. Of the 169 cases 13, or only 8 per cent., showed active rheumatic infection; 51, or 30 per cent., showed potential and mild rheumatism; whilst 105, or 62 per cent. showed quiescent rheumatic infection at their first attendance.

This classification will show the extreme difficulty of attempting differentiation. The observation, supervision, and treatment of children in the earliest stages of rheumatic infection with a view to studying the first appearance of serious disease, and the prevention of heart disease are regarded as the most important functions of this centre.

The Kensington scheme commenced on Oct. 1st, 1927, the rheumatic centre being situated at the new Princess Louise Hospital, under the direction of Dr. R. C. Lightwood.

Investigation is being made into environmental factors such as locality, housing (with special reference to dampness), family incidence, social position and the conditions of school life, and into certain clinical factors, especially the effect of tonsillectomy and institutional treatment, and into the significance of certain physical signs in connexion with acute rheumatism.

In the West of England a scheme for the prevention, treatment, and research into ætiological factors of rheumatism is in process of evolution. The area covered by its activities will be the counties of Gloucester, Somerset, and Wiltshire, and the cities of Bristol and Bath.

Work is to be directed towards accumulating more accurate information as to the distribution of heart disease of rheumatic origin, studying ætiological factors of the disease, providing expert examination and diagnosis for cases of heart disease in children, and obtaining information as to the need for institutional or other specialised types of treatment.

The central coördinating agency is a cardiac clinic at the General Hospital at Bristol, in charge of Dr. Carey Coombs.

The accommodation in England for children suffering from this disease is strictly limited. The Metropolitan Asylums Board provides 230 beds, the Invalid Children's Aid Association 46 beds (and 85 for convalescent heart cases), the Birmingham Local Education Authority 90 beds.[1] Thus something is being done to stem the tide of this vast burden of disease, but, as Sir George Newman says, it is not enough. The need is urgent and the continuance of this widespread and disabling condition is impairing the strength of the nation. There is a pressing need for coördinated action for the thorough and continuous investigation of this malady in all its forms, and then for a well-devised and systematic attack upon it.

In this connexion Sir George Newman calls attention to the reports published by the Ministry on (1) Incidence of Rheumatic Disease, and (2) Acute Rheumatism in Children, respectively reviewed in THE LANCET of March 1st, 1924 (p. 451), and July 30th, 1927 (p. 245).

Venereal Disease.

At the close of 1927 the number of V.D. treatment centres was 186—viz., 177 in England and 9 in Wales. The number of sessions averaged 780 weekly, of which 549 were in voluntary hospitals, 158 in special premises, and 73 elsewhere. The number of centres at which attendance can be made at any time of the day or evening was five. It is hoped that three more centres will be reorganised during the present year to provide these all-day facilities. Besides the treatment provided at the regular centres special arrangements exist at 11 maternity and child welfare centres by which women and children discovered to be suffering from gonorrhœa or syphilis can be treated there. The number of hostels for the care of girls suffering from venereal diseases was 14 and the number of cases maintained in them in 1927 was 895 as compared with 903 in 1926. There are eight institutions for the reception of pregnant women suffering from venereal diseases, and there is similar provision in ten of the hostels mentioned above. Included among these hostels there is one special institution for the care of children suffering from gonorrhœal vulvo-vaginitis, or from congenital syphilis, and the number of cases treated there in 1927 was 51. The number of medical officers, either whole or part-time, employed at the 186 centres was 389. The number of laboratories approved for pathological tests in connexion with diagnosis was 76, and the total number of tests

[1] This accommodation is being extended by the provision of 350 additional beds at Carshalton (see THE LANCET, Oct. 20th, p. 829), and by some 20 beds at Cardiff (see p. 895). ED. L.

carried out for treatment centres and practitioners was 308,408. The returns from venereal disease treatment centres for 1927 show a 3·7 per cent. increase in the new cases of syphilis, a 9·1 per cent. increase in those of gonorrhœa. The number of those who attended for advice on the suspicion that they were suffering from venereal disease again increased, indicating the continued popularity of the centres, while the attendances, an inverse index of defaulting before completion of treatment, were, in 1927, 46·4 per cent. more than in 1920, though the total new cases were 17,049 (16·2 per cent.) less than in 1920 and the total new cases diagnosed as venereal disease were 22,831 (26·7 per cent.) less.

The Avoidance of Relapse.—An analysis of results of treatment of male cases of syphilis at the St. Thomas's Hospital Treatment Centre shows clearly that even in primary cases in which serum reactions have not yet become positive less than two courses of ten injections each of "914" (or equivalent in other arsenobenzene compounds) and of bismuth or mercury totalling approximately 6 g. "914" and 3 g. bismuth results in too high a percentage of relapses, while three such courses are barely sufficient for early cases in which the blood reactions have become positive. The analysis shows clearly, also, the great advantage of commencing treatment whilst the serum reactions are still negative.

The Question of Compulsory Treatment.

Notification was originally introduced in connexion with acute infectious diseases and was primarily designed to give information which would allow the health authorities to take action to protect the public. These diseases were of relatively short duration and the period of infectiousness could be predicted with fair accuracy. When one considers statutory notification in connexion with the more chronic communicable diseases, such as tuberculosis and venereal disease, it is clear that quite different considerations arise.

The conveyance of infection in venereal disease usually implies special circumstances, sexual intercourse, &c., and these diseases are not comparable in this respect with the ordinary notifiable infectious diseases. Then again there is a social relationship and stigma in the case of venereal disease which causes reluctance on the part of medical practitioners to certify venereal disease. The existence of a system of notification is also only too likely to lead patients to conceal their condition as long as possible and have recourse to "quacks" (who will promise secrecy) instead of obtaining sound medical advice promptly or attending clinics or hospitals. Moreover, notification may inflict some injustice, and perhaps even irreparable social harm, upon innocent individuals or families. Again, syphilis and gonorrhœa are diseases which may be greatly prolonged in the individual, and pass through various stages or degrees of history, severity, and infectivity, and hence it might be impracticable to define the stage of disease which should be notifiable. On the whole, therefore, it has hitherto been deemed inexpedient to introduce a compulsory system of notification of venereal disease.

It is not infrequently suggested that the local authority should have powers of compulsory treatment of venereal disease, particularly in the case of persons who have begun treatment without finishing it. If official notification be an incentive to concealment and a deterrent to effective treatment, *a fortiori* is this true of compulsory treatment.

Defaulters.—It is alleged that "defaulters" should at least be compelled to continue their treatment for venereal disease. In England it is estimated that about one-third of the persons who submit themselves for treatment fail to continue it to the final stage of cure. The question is not as simple as it appears. After all, what is a defaulter? In any given community the persons suffering from venereal disease fall into three groups: (1) those who submit to complete treatment, (2) those who submit to partial treatment, (3) those who are not treated at all. It seems clear that all the persons who submit to partial treatment, and still more those who are not treated at all, are in fact the defaulters, that is to say, they do not submit themselves to complete treatment. But it must be remembered that the complete treatment of syphilis by salvarsan is a prolonged and serious undertaking; the patient may well be kept under supervision for two or even three years. At what stage in this long process of treatment can it fairly be said that a patient defaults in the sense that he has become a danger to the community?

There is a further question which will occur to us, How far does such defaulting take place in the treatment of other diseases? How many patients suffering from other maladies always complete the treatment prescribed for them? How many persons with unsound teeth default in dental treatment? How many unfinished medicines repose in domestic cupboards? How many defaulters are there for operation for adenoids, or for rheumatism, for tuberculosis, or for cancer? It is necessary to view this question of default circumspectly and consider its bearings in regard to social conditions as well as medical and surgical treatment generally. The cause of default in prolonged treatment must first be established—the disease may have been remedied, or the patient may be dead, or have left the district, or prohibitive circumstances may have arisen to prevent the continuation of treatment. Again, compulsory treatment by the State implies guarantees of cure, which cannot be given; and such compulsory treatment must entail no risks of life or injury.

These are the general grounds which have hitherto imposed serious limitations on any proposal for the compulsory treatment of disease. In the particular disease of syphilis there is a further issue, for the only justification for any form of compulsion would be an assurance that compulsory treatment of the individual ensured the protection of the public from the risk of infection by him. On this we must remember, first, that long before the syphilitic defaulter can be declared completely cured he has, in nearly all cases, become non-infective; secondly, that syphilis infection is not usually conveyed through ordinary social life, but only by direct and particular sexual intercourse; and, lastly, any compulsory treatment, to be effective upon the community, must be applied to all cases of venereal disease and not to those only who have commenced but failed to complete treatment. It seems at present impracticable to fulfil these conditions.

(*To be continued.*)

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

The Censorship of Publications.

THE second reading of the Censorship of Publications Bill was under discussion in the Dail last week, on the motion of Mr. FitzGerald-Kenney, Minister for Justice. The principal provisions of the Bill were given in these columns some weeks ago.[1] From the Minister's statement it appears that the Bill is not intended to cover so wide a ground as its actual wording suggests. The words in the Bill in reference to a book or edition that "it is indecent or obscene or tends to inculcate principles contrary to public morality or is otherwise of such character that the sale or distribution thereof is or tends to be injurious or detrimental to or subversive of public morality," are taken by the ordinary reader to signify grounds of complaint on other grounds than of indecency or immorality merely in regard to sexual matters. The Minister stated that the Bill would only deal with indecency or immorality in respect of sexual matters, and promised to add such words to the Bill as would make this limitation clear. Had the Bill been clearly drafted in the first instance in this essential clause, much of the opposition roused by the wider interpretation would have been avoided. The clause was universally read as bringing expressions of opinion on philosophical, sociological, and even religious matters within the purview of the Bill. The definition of the term "indecent" as including "calculated to excite sexual passion or to suggest or incite to sexual immorality or in any other way to corrupt or deprave" has given rise to much criticism. The last words render the definition so wide that the Censorship Board could bring under it anything that they disliked or of which they disapproved. Moreover, it is pointed out that sexual passion is not immoral, unless wrongly directed, and that to declare indecent anything which may excite sexual passion is unjustified. (One critic, indeed, had suggested that the

[1] THE LANCET, August 18th, p. 331.

Minister for Justice must be tainted by the Albigense heresy.) The Minister recognises that the definition is unduly inclusive, and he has expressed his willingness to amend it. On the question of contraception he and the Government are adamant. No book or periodical which has a word to say in favour of contraception will be permitted to circulate in the Irish Free State. A clause of the Bill which brings advertisements of cures for venereal disease and of methods of procuring abortion under the terms of the Indecent Advertisements Act, 1889, does not apply to advertisements in newspapers. It only applies to advertisements affixed to walls or otherwise exposed in public places.

Mr. FitzGerald-Kenney's statement does little more than clear away certain misunderstandings due to culpably careless drafting. On the general principle of a censorship; on the procedure of the censorship board, a tribunal sitting in secret without those whose property is affected having any right of defence, and without any provision for appeal; on the suppression of discussion on a live sociological question of the day; on all these he, and presumably the Government, stand fast. The discussion in the Dail, however, showed a greater degree of independence than was expected. From all parts of the house there were warnings of the danger of making a censorship too powerful, or of giving it too wide a scope. Many speakers, admitting that there was little exception to be taken to a censorship of periodicals, held that no case had been made for a censorship of books. Some of the most outspoken speeches came from the Government benches. There were, no doubt, some whole-hearted support for the Bill, and some demands that it should be made even more rigorous than it is. One deputy declared that there were books like Gustave Flaubert's (*sic*) 'Sappho' and Fielding's 'Tom Jones' that should not be permitted in this Christian country." It is clear, however, that the Bill is likely to be pruned of some of its more dangerous clauses before it becomes law.

Amalgamation of Hospitals.

Prof. W. Boxwell, in an inaugural address at the Meath Hospital last week, took up the defence of the small hospital. He said that 120 occupied beds gave ample material for teaching students. The ideal number of students was half a dozen, and it was impossible for one man to teach the elements of anything practical to a large class at one time. In the small hospitals the student came into direct touch with disease and the general management of the sick from the moment that he started clinical work. The patient in a small hospital which was well equipped had a large share of the doctor's individual attention, as well as that of the student. In a great hospital, instead of a class of 20 students, they would have a class of 100. In such a hospital there would be eight or ten qualified men, who would stand up between the student and the practice work that he was anxious and quite fit to do. He admitted that with amalgamation they would gain centralisation. There would be a greater opportunity and wider field for the men at the head of the profession, and accurate records would be kept.

Royal College of Physicians in Ireland.

The annual meeting of the College was held on St. Luke's Day in the College Hall. Dr. W. A. Winter, was re-elected President, Dr. H. T. Bewley treasurer, and Dr. T. P. C. Kirkpatrick registrar. The following censors were appointed:—In medicine: Drs. J. A. Matson and R. H. Micks. In midwifery: Dr. S. Sheill. In medical jurisprudence: Dr. J. T. Wigham. In the evening the St. Luke's Day dinner was held, some 80 Fellows and guests being present. Among those who spoke were Sir John Moore, the Chief Justice of the Irish Free State, and the Bishop of Tuam.

School of Physic, Trinity College.

The Rockefeller Foundation has recently made arrangements with the authorities of Trinity College for the endowment of a limited number of Fellowships in the School of Physic. Each Fellow, who will be paid at the rate of £500 a year, will devote his time to teaching and research. In the present year Dr. R. A. Q. O'Meara has been appointed Fellow in Public Health; next year a Fellow in Biochemistry will be appointed; a third in another subject in the following year. The whole scheme will be reconsidered at the end of five years.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Advertising as Unfair Competition.

NOT long ago four medical men were prosecuted at Hamburg before the criminal court for having advertised their services to the public. Hitherto advertisement in the daily papers has been punished only by the professional courts of honour, but in this instance the public prosecutor brought an action for unfair competition because the defendants had advertised themselves as specialists in venereal diseases, which they were not. At the trial they had to admit that they had not had any training other than that enjoyed by the average practitioner, and they were fined M.50 each and costs. The court held that the unfair competition consisted not only in their describing themselves as specialists, but also in their advertising at all. As respectable medical men do not advertise an advertising practitioner competes unfairly with colleagues who obey the rules of the profession. This judgment will be of fundamental importance if it is upheld by the higher courts.

Control of Venereal Disease.

The new law concerning the prevention of venereal disease has now been in full operation for one year, but little is heard, either in the medical or lay press, of legal proceedings being taken under any of its provisions. The measures taken in Berlin have lately been described by Prof. Schweers, a member of the Municipal Health Office, who states that the city has started 17 dispensaries, with 46 specialists, where people suffering, or believing themselves to suffer, from venereal disease may receive free consultation without their names being asked. The dispensaries, he said, have been much frequented during their first year, some 12,000 men and 9000 women having applied for treatment or advice. 9000 cases of venereal infection have thus been ascertained, the patient being either treated at the dispensary or referred to his sick-club or his medical attendant. Nurses appointed in connexion with the dispensaries have to visit the patients at home and see that the disease is not further spread and that the origin of the infection has been discovered. The city authorities have also opened departments for venereal diseases in their hospitals, and here the patients are attended free of charge, no attempt being made to recover the costs, as is sometimes done after treatment of other conditions. By day and night the dispensaries distribute preventives free of charge, and though this practice was at first much criticised from a moral standpoint it is now agreed that venereal disease must be fought with every available weapon. Prof. Schweers says that there have been only 350 cases in which patients have been compelled by the police to attend the dispensaries. The law places the medical man under obligation to notify cases in which patients do not complete their cure. In the first year 2000 such cases have been notified, and it is hoped that the number will greatly diminish when the public become aware that they need fear no violation of professional secrecy by the staff and that they may have confidence in the measures taken. The state of things now is very different from what it was formerly, when prostitutes were registered and medically examined. In the city of Berlin with 4,000,000 inhabitants only 7000 prostitutes were registered, and

it was obvious that there was a much larger number of unregistered women who regularly or in times of unemployment were prostitutes but were never examined. To watch those 7000 women there was a staff of 130 police, and this department has now been entirely abolished, the matter being in the hands of the health authorities. The complaint is made that since the abolition of the department prostitutes are seen more commonly; but this has nothing to do with the law against venereal diseases, for the police still have the right to clear the streets of these undesirable women.

Proposed Reform of Medical Study.

The overcrowding of the curriculum with so many special subjects has led to a demand for reform and several plans have been suggested. Prof. Brauer, of the great Hamburg Hospital, thinks that the results at medical examinations are unsatisfactory because it is no longer possible for students to be trained in every branch of medicine. He considers that after the preliminary examination in normal anatomy, physiology, and chemistry the medical course should be limited to internal medicine, surgery, gynæcology, and obstetrics, and that only these subjects should be taken in the final examination. The proposal is that other medical and surgical studies should no longer form part of the ordinary curriculum, and it follows that anyone who wants to practise them should be obliged to take an extra course of post-graduate study to qualify himself as a specialist. If an examination was required at the end of such courses it is felt that the number of inadequately trained specialists would be reduced.

Restriction of Remedies Used in Insurance Practice.

A list of remedies suitable for club practice has been issued by a committee composed of representatives of the German Society for Internal Medicine, the Pharmacological Society, the medical press, the Society of Licensed Chemists, and the Ärzte Vereinsbund. This committee was set up some time ago with the object of eliminating the enormous quantity of ineffective, unnecessary, and too expensive compounds on the market. It examines the compounds to see whether they are suitable for club practice, and to ensure impartiality the examination is done at pharmacological university institutes, at university clinics, and at hospitals. If the reports are satisfactory the name of the preparation is included in the list. To pass the test it must be sufficiently proved that the remedy is effective and innocuous, its composition must be known, and the advertisement of the producer must be in accordance with the facts.

Shortage of Hospital Assistants.

Notwithstanding the overcrowding of the medical profession and the obstacles to younger medical men engaging in practice there is always a demand for assistants in hospitals. In nearly every issue of the medical journals there are advertisements in which hospital authorities offer vacant places, and such advertisements sometimes appear in several successive issues. The reason is not always the inadequate payment, these appointments being intended for younger medical men who do not want money so much as experience. Prof. Brunner, of Munich, offers the explanation that the medical assistant is nowadays overburdened with work. During the period of prosperity in Germany municipal authorities used to erect lavishly furnished hospitals. Since the war, however, they have been compelled to save by making the hospital staffs as small as possible. The departments have sometimes been made so large that the chief physicians are unable to examine their patients regularly, and the principal work thus devolves on the assistants. Moreover, there is an enormous mass of clerical work to be done in the public hospitals; after a hard day's work the assistant has to write histories of his cases, which, with few exceptions, for ever disappear in the archives of the hospital. This work should be done by shorthand writers. The routine task of examining urines and other secretions, which takes so much of the time of the assistant, might well be left to nurses.

There are other drawbacks, also, to taking an assistantship. Nowadays a medical man is admitted to club practice, at any rate in the greater cities, only after having settled there for four years. The assistant who enjoys a good training can settle only after his assistantship is finished, and he thus loses several years in comparison with the average medical man, who settles immediately after having qualified.

Statistics of Sick-clubs.

According to a recent statistical report 20,288,000 people are insured against illness in sick-clubs under the workmen's insurance laws. The dependants of insured persons also enjoy some of the benefits, and if they are included it may be said that some two-thirds of the German population belong in some way or another to a sick-club. There are 7679 institutions of this kind under various descriptions in Germany, the biggest being the Berlin General Sick-club with over 484,000 members; there are, moreover, a number of clubs for special trades. In 1926 only 45·3 cases of illness for each 100 members were registered, compared with 52·3 cases in 1925; but the average duration of an illness had lengthened to 26·1 days in 1926 as against 24·6 in the previous year.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Indoor Ultra-violet.

THE regular advertisement and one may suppose the regular sale of ultra-violet transmitting glass for the making of windows for school-rooms and office-buildings has suggested to Dr. Janet H. Clark, of the Johns Hopkins School of Hygiene, some experiments measuring the amount of ultra-violet that actually reaches the interior of a room through such a medium. The quantity is too small for direct measurement, but Dr. Clark overcomes this difficulty by measuring first the ultra-violet intensity from the skyshine at the window-sill (direct sunlight is ruled out, since obviously neither school-children nor stenographers could work in its glare), and then comparing the intensity of illumination at the window-sill with that in the centre of the room. Detailed calculations will be found in a recent issue of *Science* (August 17th). The conclusion is that only 1/120th of the north sky ultra-violet reaches the middle of the room. A child would have to sit in this position for 20 hours to receive as much ultra-violet as he would receive in two minutes out of doors in the noon sunlight. Dr. Clark feels that it is cheaper and more efficient to give the school-children a short noonday recess than to invest in any special window glass.

The Trend of Venereal Disease.

The New York State Department of Health recently sent a questionary to the physicians in "upstate" New York asking whether venereal diseases were increasing or decreasing. Less than half of those who replied would venture an opinion, but 1826 physicians stated a definite opinion as follows: decrease, 961 (52·5 per cent.); no change, 445 (24·4 per cent.); increase, 420 (23·1 per cent.). Education and prophylaxis were the main reasons given by those who believed in a decrease, as causes of the decrease; while those who had experienced increased incidence attributed this to moral laxity and better diagnosis, showing that some of them, at least, consider the increase as apparent rather than real. Forty physicians in each group named prohibition as a source of increased and of decreased incidence respectively. Extraneous evidence received by the officers of the health department leads them to believe that the majority opinion favouring a decrease in incidence is correct.

CENTENARY OF KING'S COLLEGE.

WORK OF THE MEDICAL FACULTY.

IN connexion with its centenary next year, King's College, London, is making an appeal for funds which will be warmly commended by the medical profession. One of its first Faculties was that of medicine; not long after its establishment, in 1839, the College initiated King's College Hospital in Lincoln's Inn Fields; and from the very beginning medical science has flourished within its walls. Among those responsible for the Faculty in the early days were such men as Herbert Mayo, Richard Partridge, and John Curnow, the anatomists, and Bentley Todd, William Bowman, Lionel Beale, and William Rutherford, the physiologists. Others on its staff have been David Ferrier, Peter Thompson, T. J. Brodie, Alfred Garrod, and Gerald Yeo, whilst it will always be remembered with pride that the College was responsible for bringing Lister back to London in the face of considerable opposition. We need only recall the names of Prof. Arthur Robinson, Prof. David Waterston, Prof. J. E. S. Frazer, Prof. E. Barclay-Smith, Prof. W. E. Dixon, Prof. W. D. Halliburton, and Sir Charles Martin as representative of the many distinguished men who have worked at the College in later years to the advantage of medicine.

Before the war the number of students in the Medical Faculty was about 170, but last year it had risen to 211. The College has the advantage of coöperating not only with King's College Hospital at Denmark-hill, but also with St. George's, Charing Cross, and Westminster Hospitals from which students come for pre-clinical work. Those who receive their medical education at the College have the considerable advantage of coming into contact with students who are studying other subjects, and their outlook is to some extent broadened as it would be at Oxford or Cambridge. Unfortunately, however, although the laboratories have been largely remodelled and extended, the anatomical department is still housed in premises which are none too satisfactory, and one of the objects of the centenary appeal for £350,000 is the improvement of accommodation there. A 200 years' lease has been acquired of an area of nearly 5000 square feet above Aldwych Station, and the building to be put up on this site will enable the College to meet the modern requirements of all its departments except those of chemistry and anatomy, which can best be secured, it is stated, by rebuilding the south-east block and erecting new buildings for anatomy upon the roof at a cost of about £60,000. The anatomical department would there find itself immediately beside the department of physiology, and teaching could be carried out in closer association with the clinical schools. At present the chairs in both these subjects are unendowed, and it is urgently desired that a sum of £25,000 should be found to endow, at any rate, the chair of physiology.

Subscriptions to the Appeal Fund may be sent to the treasurers (who are Mr. Reginald McKenna and Sir Edward Troup) at the College, cheques being made payable to the King's College Centenary Appeal Fund. The Duke of Connaught is President of the centenary commemoration Committee, and the medical members are Sir John Atkins, Prof. E. Barclay-Smith, Dr. Michael Beverley, Sir Charlton Briscoe, Prof. Albert Carless, Sir Lenthal Cheatle, Sir Watson Cheyne, F.R.S., Sir John Cockburn, Prof. W. D. Halliburton, F.R.S., Prof. R. Tanner Hewlett, Dr. Graham Little, M.P., Mr. H. Willoughby Lyle, Prof. Greville Macdonald, Prof. R. J. S. McDowall (Dean of the Medical Faculty), Dr. Charles S. Myers, F.R.S., Sir W. J. R. Simpson, Lieut.-General Sir Arthur Sloggett, Sir StClair Thomson, and Sir Nestor Tirard.

EAST SUFFOLK AND IPSWICH HOSPITAL.—On Saturday last Princess Mary opened a new pathological department which has been built and equipped at a cost of £12,000.

BRITISH MEDICAL ASSOCIATION.

COUNCIL DINNER.

THE seventh annual Council dinner of the British Medical Association took place on Oct. 17th at the Hotel Victoria, London, a large and distinguished company being present. The chair was occupied by Dr. H. B. BRACKENBURY, the Chairman of Council.

Those present included Sir Robert Philip (retiring President), Lord Eustace Percy (President of the Board of Education), Lord Cozens-Hardy, Sir Boyd Merriman, K.C. (Solicitor-General), Sir John Rose Bradford (P.R.C.P.), Sir Thomas Barlow, the Lord Mayor of Cardiff (Alderman A. J. Howell), Sir Ewen Maclean (President, B.M.A.), Mr. N. Bishop Harman (treasurer, B.M.A.), Sir Robert Bolam, Sir Philip Magnus, Surgeon Vice-Admiral Gaskell, Dr. R. A. Fleming (P.R.C.P. Edin.), Dr. Walter Carr (President, Medical Society of London), Dr. Graham Little, M.P., Dr. Andrew Balfour, and Lieut.-Colonel F. E. Fremantle.

After the toast of "The King" had been loyally pledged, Dr. Brackenbury proposed "The Retiring President" in terms of warm appreciation. All who had been brought into relationship with Sir Robert had, he said, been struck by the magnetism of his personality and the charm of his oratory. His official tenure began with esteem, it was ending with a sentiment of real affection, which the speaker was sure would be as enduring as it was sincere. It was hoped that there would still be many occasions on which his help to the Association would be forthcoming. He also referred to the new arrangements which had been made concerning the Association's large library, which would not need the continuance of the post of honorary librarian. In this connexion he had great praise for Mr. W. G. Spencer, and he alluded to the fact that in 75 of the 96 years of the Association's life a member of the Honeyman family had officiated in the library. The toast was accorded musical honours.

Sir Robert Philip, in responding, said he had been much touched by the warmth of the references to himself, and in return he thanked the whole Association for the great kindness every member with whom he had come into relationship had shown him. He was most anxious to express his indebtedness to the Representative Body for numberless acts of real friendliness. He concluded by giving a brief sketch of the history of the Association, from its inception 96 years ago in Edinburgh, owing to the energies of Dr. Hastings, till now with its membership of 34,000 and its annual revenue of £80,000. It was contended by many, he said, that the Association was a trade-union. He would concede so much as to admit that it was a union of highly trained medical men whose lives were dedicated to the service of their fellow creatures in the direction of the relief of suffering and the prevention of disease, and in the development of these aspirations no outside interference would be allowed. While the Association maintained its main concepts it was bound to go on from strength to strength.

Mr. Bishop Harman submitted the toast "The Common Health," remarking that such a toast was so comprehensive that it included every other. His theme was the progress of the healing art and the consequent betterment and greater expectation of life of the community. A very large factor in this was the medical inspection of schools, which at first received the frowns of masters, mistresses, and teachers, whereas now the school medical officer was not only welcomed but was expected to accomplish the impossible. He tilted at the present-day popular instructors of the public in health matters and the bewildering variety of their advice. He would say it was good for a man to eat and to do what he liked, so long as he found he could go on liking it.

Lord Eustace Percy replied. He admitted there were a number of serious problems in regard to health, but as he felt in holiday mood he did not intend to inflict a discussion of them on the assembly. He felt much more inclined to utter his feeling of sincere pleasure at the extraordinary progress which had been made in medical matters in recent years; the improvement in "the common health" in the last 20 years had been most striking and gratifying. He had been particularly struck with the marked improvement in school health, which coincided with the establishment and development of open-air schools, and with the introduction of physical training. It was not easy to see how far hygiene could be taught by direct instruction, but more help was likely to come from physical training than from anything else. He concluded by paying a graceful tribute to the devotion and continuous activity of the general practitioner. Though confessedly there were not many signs of fatigue at this festive board, he had never been able to understand

ıow the average doctor survived the perpetual calls upon ıis time and energies.

Sir Ewen Maclean, in proposing "Our Guests," expressed he sense of appreciation of the Association that so many listinguished men had accepted the invitation to dine.

Sir Boyd Merriman, in the course of an amusing reply, aid he had never understood how a chemist, who received prescription in some unknown hand and in hieroglyphics vhich were unintelligible to the ordinary person, could at once make it up. Was it that the front of the prescription vas intended to impress the ordinary layman like himself, nd that on the back, in practically invisible ink, was vritten some mutually understood sign, such as "No. 9"? n the name of himself and his fellow guests, he took off his at to the British Medical Association and all that it stood for.

Sir Thomas Barlow also responded, making a special oint of his appreciation of the increased contributions to he Royal Medical Benevolent Fund.

Dr. J. W. Bone proposed the toast of "The Chairman," lluding to his various activities, medical and municipal, nd Dr. Brackenbury briefly replied.

Between the speeches some excellent musical items vere rendered.

Obituary.

ALEXANDER NAPIER, M.D., F.R.F.P.S. GLASG.

By the death of Alexander Napier in his native ity one of the few remaining links with the Lister linic in Glasgow has been severed. Born in Glasgow n 1851 he began the study of medicine in 1867, and ad already passed the qualifying examinations a ear before he was entitled to practise. After spend- ng a year in post-graduate work in Berlin he became onversant with German ideas and literature in nedicine, and translated for the New Sydenham Society Eulenberg and Guttmann's "Physiology and Pathology of the Sympathetic System," and Gutt- nann's "Handbook of Physical Diagnosis."

At Glasgow he chose the south side of the city nd soon established himself in a large family practice. But his interests and energies were not such as could e confined to the area of professional activity. A een volunteer, he became associated with the old 3rd Lanarkshire R.V., and retained this association n the new Territorial Force, becoming commanding fficer with the rank of colonel of one of the Scottish eneral hospitals at Stobhill during the war.

From 1880 till 1888 he was assistant to the professor f materia medica in the University, and for long ntervals during this period was solely responsible or the conduct of the class. From 1888 till 1893 he vas professor of materia medica in Anderson's College of Medicine. When the Victoria Infirmary vas established in 1890 he was appointed one of the isiting physicians, and retained this post for 29 years. There was no aspect of medical or scientific activity n the city to which he did not contribute his share. He was librarian to the Faculty of Physicians and a member of the Council; he took an active interest n the Medico-Chirurgical Society and in the Southern Medical Society, of which he was President; he was member of the Royal Philosophical Society; and much of his time and energy was devoted to the evelopment of St. Andrew's Ambulance Association. A physician of the old school, he was classed by the ounger generation with Gairdner, Finlayson, McCall Anderson, Middleton, and Gemmell. He was, how- ever, keenly alive to all the significance of the more ecent exploits in medical investigation, and assessed with keen insight and firm judgment the value of new discoveries. He was one of the first, if not the very first, to introduce Koch's tuberculin. Generous and unselfish to an intense degree, he eschewed the more popular prizes of professional success for a life of devoted service, and his name will be remembered by his patients, by his professional brethren, and by all those with whom he came into contact in the wider fields of his work, with appreciation and gratitude.

I. M.

Correspondence.

"Audi alteram partem."

"HYPERVITAMINOSIS" AND "VITAMIN BALANCE."

To the Editor of THE LANCET.

SIR,—The experimental observation that vitamins exert their normal physiological action when consumed in very minute doses naturally leads to the inquiry "Have the vitamins any injurious effect when consumed in abnormally large amounts?" A similar question arises, "Does an increased or diminished consumption of one vitamin affect the body's requirements for the others?"

To Takahashi[1] must be given credit for the first suggestion that vitamins in large excess might be toxic. In 1922–25 he published papers in which the isolation of pure vitamin A ("biosterin") was claimed, and in describing the product he mentioned that massive doses (16 mg.) proved fatal to rats. Prof. J. C. Drummond and his collaborators, however, had been engaged in a patient research in the same field and were able to contradict Takahashi's claim to have isolated the vitamin. Using carefully prepared concentrates no toxic action could be noticed in large doses, and it was suggested that the Japanese worker had been deceived by the presence in his preparation of poisonous by-products. Subsequent interest in the problem naturally became small, and it was generally assumed that to both the questions in the preceding paragraph a negative answer could be given.

There have appeared from time to time, however, several isolated and little known observations, mostly recorded in somewhat inaccessible literature, which seem to deserve more attention than they have received. In 1923 the pioneer investigator, Sir Frederick Gowland Hopkins[2] had made mention of researches in which excess of cod-liver oil had often been found injurious to rats unless "balanced" by an increased marmite (vitamin B) allowance. On somewhat similar lines Euler and Widdell (1925) made the surprising claim that excess of cod-liver oil caused disturbances in the growth and bone formation of rats unless balanced by *vitamin C*. More recently Agduhr (1926)[3] has reported that feeding excessive amounts of cod-liver oil to various animals produces degenerative changes in the heart, although Höjer (1926)[4] has attributed these results merely to an inadequate provision of the B-vitamin complex. Gladys Hartwell (1927) and Barnet Sure (1927) have also carried out isolated work on the excessive feeding of cod-liver oil, special attention having been drawn to the injurious action of large excess of the oil during gestation.

In all the foregoing work cod-liver oil or its concentrates were used as sources of vitamin excess. Recently a new field has been opened by the use of irradiated ergosterol, the richest known source of vitamin D, in place of cod-liver oil. Pfannenstiel (1927),[5] and Kreitmair and Moll more fully in 1928,[6] claim to have produced ill-effects by the administration of this material in massive doses; the latter workers were able to observe extensive depositions of calcium in the body and a generalised sclerosis—phenomena which are of interest in view of the known action of vitamin D in increasing Ca (or P) absorption. That these records should be received not without some scepticism, or

[1] Jour. Chem. Soc., Japan, xliii., 826.
[2] Brit. Med. Jour., 1923, ii., 693.
[3] Acta Pædiatrica, v., 319.
[4] Ibid., vi., 2.
[5] Klin. Woch., xlviii., 2310.
[6] Münch. med. Woch., lxxv., 637.

at least confusion, is understandable; for numerous other workers have recorded the harmlessness to a human of "large" doses of irradiated ergosterol, or to a rat up to 10,000 times the minimal effective dose.

During the past year an attempt has been made in our laboratory to collate experimentally some of these scattered observations. A thorough survey is in progress, but we think it advisable to summarise the results so far obtained, which, in a general way, confirm definitely the idea of a harmful effect resulting from excessive intake of certain vitamin concentrates. Our main conclusions are briefly as follows:—

1. *Excessive Irradiated Ergosterol.*—Young rats given synthetic diets containing 0·1 per cent. of irradiated ergosterol (i.e., 100,000 times the concentration adequate for protection from rickets) invariably lost weight rapidly and died. Great loss of appetite occurred, so that at death there was an appearance of inanition, recalling the effect observed in cases of vitamin B deficiency. Only in one instance, however, did an increase of the vitamin B allowance to four times the usual level cause an appreciable delay in the development of these ill-effects. Non-irradiated ergosterol (devoid of vitamin D) given to controls in the same amount caused no loss of appetite or deviation from the normal growth-rate, nor did smaller doses (0·001 per cent. and 0·00001 per cent.) of either irradiated or non-irradiated ergosterol. The ill-effects may quite conceivably have been caused by impurities in the irradiated ergosterol rather than by vitamin D itself, but, since we have found that heated ergosterol has no deleterious effect, it is obvious that impurities which are common to the processes of heating and irradiation cannot be held responsible. Similar tests are in progress on specimens of activated ergosterol in which the D factor has been destroyed by over-exposure to irradiation. Among other aspects of the problem being examined are: the intestinal reaction, Ca and P absorption, and electrocardiographic changes.

2. *Increased Vitamin D Allowance accompanied by Total Vitamin B Deprivation.*—We found no appreciable change in the onset of B-avitaminosis in animals provided with 100 times the normal allowance of vitamin D as irradiated ergosterol.

3. *Excessive Cod-liver Oil and Retarded Growth.*—Rats given restricted allowances of vitamin B (marmite) were found to have distinctly lower growth-rates when cod-liver oil was substituted for the 15 per cent. of Arachis oil (inactive) supplied in our synthetic diet.

4. *Skin Lesions resulting from Excess of Cod-liver Oil Concentrates (A and D) in the Absence of Vitamin B.*—Rats receiving massive doses of cod-liver oil concentrate (kindly supplied by Messrs. Lever Bros.) in conjunction with a diet deficient in the vitamin B complex often developed loss of hair and sore areas of the skin (superficially bearing resemblance to B_2 deficiency, "pellagra"). Such symptoms were not observed in rats suffering from plain vitamin B deficiency, nor in rats receiving an adequate supply of marmite in addition to the concentrate.

5. *Failure of Pregnancy on Excessive Cod-liver Oil.*—In confirmation of Hartwell and of Sure, we observed that normal gestation always failed in rats receiving a diet containing 15 per cent. of cod-liver oil.

It would seem probable that while some effects of "vitamin excess" are due to the vitamin itself, others may more likely be due to other bodies present in the concentrate. Any evidence so far available for "vitamin balance" is not so clear-cut as might be wished.

We think it desirable to add, in case of possible alarmist fears, that the quantity of vitamin D which proves toxic to a rat, although forming less than 0·1 per cent. of the diet, is yet some 100,000 times an adequate "physiological dose." The toxic dose varies somewhat from one species to another, but there should be little practical danger to humans of ill-effects from excessive vitamin intake.* The application of these studies lies more in that little understood problem—the mode of vitamin action.

We are, Sir, yours faithfully,

LESLIE J. HARRIS, Sc.D., Ph.D.
THOMAS MOORE, D.Sc.

Nutritional Laboratory (Medical Research Council), Cambridge, Oct. 18th, 1928.

VACCINATION REFORM.

To the Editor of THE LANCET.

SIR,—In reply to the letter of Sir Leonard Rogers I may say that as long ago as 1885, when the severe type of small-pox was very prevalent in London, I was for some months brought into contact with cases almost daily, and learned fully to value the protective power of vaccination. Times and circumstances, however, change; it is well for us all from time to time to review the foundations of our beliefs and practice, hence in my address I deliberately raised the question of the necessity of universal vaccination, under present conditions, for those not likely to be specially exposed to the risk of infection by severe small-pox. Three outstanding facts influence me.

1. The practice of vaccination in this country has for a long time been steadily declining, until now I suppose a very large minority, perhaps an actual majority, of the population is unprotected even by one vaccination. No doubt from the public health standpoint the ideal would be universal vaccination in infancy and revaccination at intervals of from seven to ten years afterwards. The worries of medical officers of health would be greatly lightened thereby. Does anyone, however, seriously imagine that, under present circumstances, there is the least probability of any material increase in the number of vaccinations? Do not all the indications point to a continuance of the steady decrease which has been going on for so long? Especially whilst we have with us a form of small-pox which carries few if any terrors except its name, and which gives rise to little if any more malaise and discomfort than does vaccination itself. Possibly the modified form of vaccination recommended by the Committtee on vaccination may arrest the decrease, but even if this change is adopted, some years must elapse before we should know much about the amount and duration of the protection which would be afforded.

2. Despite the diminution in the number of vaccinations performed, epidemics of severe small-pox in this country are now comparatively rare and are controlled with ever-increasing effectiveness by isolation and vaccination of contacts. A mortality of 44 per cent. in one recent outbreak sounds very impressive, but Sir Leonard Rogers does not mention the total number of cases. So also do the 278 unvaccinated child victims in the Gloucester epidemic of 1895; but things have changed much in the succeeding 33 years; what was the mortality in the more recent epidemic in that city? For many years past we have been repeatedly assured on the highest authority that a widespread and fatal epidemic of small-pox was certainly impending in our increasingly unprotected community, but the prophecy is not fulfilled, and it is dangerous to cry "wolf" too often. Not so many years ago warnings, as lurid as those we have heard so often of the risks of small-pox, might have been given of the dangers threatening us from plague or from cholera, both frequently epidemic in the gravest forms in other parts of the Empire,

* Since our letter was written this question has been discussed in an annotation in the current LANCET. The results of Hess and Lewis (Jour. Amer. Med. Assoc., 1928, Sept. 15th, p. 783), who administered irradiated ergosterol to rickety infants at the admittedly high level of 2·5–5 mg. per diem, are there quoted. These authors obtained remarkable benefit in every one of a large number of cases with only two instances of clinical disturbance due to hypercalcæmia. We agree with them that any indiscriminate use of unreasonably large doses of irradiated ergosterol would be undesirable and that a fully adequate dose, according to all the evidence at present available, would be 0·5 mg. as a prophylactic, or 1·0 mg. for the average case of rickets.

but these diseases have ceased to be a serious menace, although plague in past centuries and cholera much more recently caused an enormous mortality here. Is it not reasonable to believe that small-pox may be in process of becoming gradually as innocuous in this country as plague and cholera have already become?

3. Lastly we have had during recent years the disquieting occurrence of cases of post-vaccinal encephalitis. It is probably impossible to know how many there have been in England and Wales; they do not figure under deaths from "Vaccinia" in the reports of the Registrar-General, but the disease is admitted to have caused at least 48 deaths during two periods of about 33 months in all. It is said, quite truly, that this is an infinitesimal figure among the total number of vaccinations performed in that period, although it is almost as large as the number of deaths attributed to small-pox during the same time. An immediate, even if small, danger, however, makes a greater impression upon the mind than a remote and possibly even eventually bigger one. Certainly it is a tragedy for a child, previously perfectly healthy, to die from post-vaccinal encephalitis, and it is at least fair to ask and to discuss the question whether the need for the prevention of small-pox at the present time justifies this sacrifice of healthy young lives. It is important and significant to note that in Holland the incidence of this disease has led to the temporary suspension of compulsory vaccination.

I shall doubtless be told that, so far as we know at present (admittedly we do not know much), the great majority of these cases occur in children who have not been vaccinated in infancy and that consequently the occurrence of the disease is an additional argument for the performance of vaccination during the early months of life. I anticipate that, so long as small-pox continues to be as mild as it has been in recent years, to tell the parents of an infant that he ought to be vaccinated at once, because if the operation is postponed a few years the risk of illness and possible death from disease of the brain will be greater, is not an argument which will make much appeal to the average English parent.

I am, Sir, yours faithfully,
J. WALTER CARR.

Cambridge-terrace, N.W., Oct. 21st, 1928.

DEATHS UNDER ANÆSTHESIA.

To the Editor of THE LANCET.

SIR,—The cases of death under anæsthesia reported by Dr. Ross Mackenzie and Prof. Shennan in THE LANCET of Oct. 6th are of great interest, but fortunately the first and third at any rate are much more severe risks than are likely to be met with often in ordinary practice. The second case, however, appears of a commoner type, and in this connexion I wish to draw attention to what may be a common error in the treatment of cases of collapse under spinal anæsthesia—that is, the practice of raising the head or putting the patient level. This is, of course, done under the assumption that the symptoms are due to the anæsthetic agent reaching the medullary centres, but there is, I believe, little if any risk of this after ten minutes, at any rate if the light solutions are used.

The fall in blood pressure occurring with spinal anæsthesia is nearly always swift and often severe—e.g., from 140 systolic to 54 in ten minutes—but is usually accompanied by a slow regular pulse; it is the falling pressure with rapid pulse, as in the case reported, that causes most anxiety. If not the only source of danger this fall in blood pressure is probably the most serious, and is best combated by the adoption of the Trendelenburg position, which has often been shown to result in an increase of the systolic pressure by as much as 20 or 30 mm. Hg, which is no small amount in a collapsed patient. The free use of oxygen is of considerable benefit, combined with carbon dioxide if the respirations are very weak. The customary stimulants, such as strychnine, camphor, and pituitary, appear to be without demonstrable effect on the pulse or blood pressure when once the latter has fallen.

I am, Sir, yours faithfully,
R. J. CLAUSEN, M.B., B.S.

Wimpole-street, W., Oct. 17th, 1928.

A CENSUS OF BLIND-AND-DEAF CHILDREN.

To the Editor of THE LANCET.

SIR,—The National Institute for the Deaf is now considering the question of the early training of children who were born, or have become both blind and deaf. It is obvious that unless such unfortunate children are specially and suitably cared for from very early life, their lapse into physical and mental incompetence is almost unavoidable. At the present time no distinctive provisions are available for the care of such young children. Single-type institutions, either for the blind or deaf, cannot receive them. We are anxious to get to know of the numbers of these doubly afflicted children who do not generally come under the notice of public authorities until an age at which the retardation, due to silence and sightlessness, has become of grave importance and difficulty. It has been suggested that an appeal to doctors, nurses, and those concerned with hospitals, baby welfare clinics, and other organisations dealing with childhood would be likely to help us in tracing these blind- and deaf-children. May we therefore request those of your readers who may know of cases of children of any age up to eight years, who are both blind and deaf, to help us by sending us full particulars of them?

I am, Sir, yours faithfully,
A. J. STORY, Secretary.

2, Bloomsbury-street, New Oxford-street, W.C.1
Oct. 22nd, 1928.

FEE-SPLITTING.

To the Editor of THE LANCET.

SIR,—In your recent editorial on this subject you quote a signed statement that this practice is universal in the State of Ohio. I practised as a College physician for four years in Ohio, and had frequent recourse to consultations. On only one occasion did a consultant offer to share his fee with me. It is admitted that my clients were not wealthy, and that the consultants might be a selected group, but at least I feel qualified to sign a statement that in Ohio the practice of fee-splitting is *not* universal.

I am, Sir, yours faithfully,
ROSSLYN EARP.

Oct. 10th, 1928.

HÆMATOLOGICAL ABSTRACTS.

To the Editor of THE LANCET.

SIR,—I have been asked to undertake the preparation of abstracts of British works on hæmatology for the new French periodical *Le Sang*. The work would be much facilitated if authors would be so kind as to send me reprints of their papers. Articles dealing with diseases of the blood, symptomatic blood changes, blood cells, leucocytic enzymes, and blood chemistry are included.

I am, Sir, yours faithfully,
A. PINEY, M.D.

Cancer Hospital, Fulham-road, London, S.W. 3,
Oct. 16th, 1928.

WELFARE WORK AND THE PRACTITIONER.

To the Editor of THE LANCET.

SIR,—"A. B." does well to call attention to a growing practice which in many cases amounts to an abuse. I would like to add to his experience an account of what happens in my district in the case of children of school age.

Every effort is made to force parents to take children to the school clinics. So sure as the child is away a

day the education officer is round pestering the parents to take the child to the school clinic. This worthy's attentions are not subdued notwithstanding that he is informed that the child is under a private practitioner's care and that a medical certificate is furnished. He calls again and again until the parents take their child to the clinic, even telling them that they must take their children there. The parent gets to believe this, or gives in to sheer persistent importunity, and the practitioner loses his case. The attendance officer is ably seconded by many of the school teachers who exercise similar persuasions on the parents and in many cases instruct the children to go to the clinics.

All this really amounts to touting for the children by the agents of the clinics. The private practitioner's hands are firmly tied, for he is not allowed to send agents to collect cases, but the clinic's agents seem to have carte blanche to scour the district for every sick child. This result is a very serious outlook for the practitioner. He is in a false position and must helplessly witness his own downfall.

I am, Sir, yours faithfully,

Oct. 20th, 1928. ALGY.

To the Editor of THE LANCET.

SIR,—A. B.'s letter in your last issue prompts me to ask whether these same welfare workers may not be instructed to use discrimination in their visits to mothers who have recently given birth. When my first child was born, my house was visited, although I should have thought that the patent fact that it is a doctor's house might have been sufficient deterrent. I happened to be in at the time, and firmly, but kindly, pointed out how unnecessary her visit was—she agreed. Soon after the birth of my second child, again did a welfare worker appear on the scene. This time it was my wife who was interviewed, who also pointed out that a doctor's house was hardly one which she should have considered it her duty to visit. She, however, persisted with her string of questions, until it must have dawned on her how unwelcome she was when she departed.

Surely these people should pursue their work amongst the needy and those not sufficiently educated in the laws of health and cleanliness, and who cannot afford to call in their doctor except in cases of real urgency.

I am, Sir, yours faithfully,

Oct. 23rd, 1928. C. D.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Lt.-Comdr. O. North is placed on the Retd. List.

Surg. Lt.-Comdr. O. J. M. Kerrigan to be Surg. Comdr.

J. W. L. Crosfill to be Surg. Lt.

The following appointments are notified: Surg. Comdr. J. C. Sinclair to *Cleopatra*; Surg. Lts. A. R. Ewart to *Lupin* (on recomm.); J. D. Sayers to *Herald* (on recomm.); and D. C. Drake to *President*.

ROYAL ARMY MEDICAL CORPS.

Maj. J. T. Simson retires on retd. pay.

The undermentioned from the seconded list are restored to the establishment: Majs. R. G. Martyn and T. H. Twigg; Capt. A. P. Draper and Lt. (on prob.) F. Walsh.

Maj. E. L. Fyffe retires, receiving a gratuity.

Capt. W. J. F. Craig is secd. whilst undergoing a course of study in Japan.

D. G. Hamilton to be Temp. Lt.

ROYAL AIR FORCE.

The undermentioned are granted short service commissions as Flying Officers for three years on the active list: J. L. Groom, N. M. Jerram, G. W. Paton, and G. O. Williams.

Flying Officer P. B. L. Potter ceases to be seconded to the Princess Alice Memorial Hospital, Eastbourne.

INDIAN MEDICAL SERVICE.

Lt.-Col. J. H. Murray retires.

Temp. Lts. to be Temp. Capts.: Bhalchandra Kondopant Phatak and Gurbaksh Dhamrait Rai.

The undermentioned appts. are made: Gurdit Singh Malik, Bhairo Prasad Nigam, Sambhunath Roy, and Neelakanda Pillai Palpou Pillai to be Temp. Lts.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1927 statistics of two large seaport cities:—

Name of city and estimated mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with Influenza.	Heart disease.	Infant mortality.	Diarrhœa, &c., under 2 years.	Maternal mortality from childbirth.
Hull .. .. (296,600)	21·0	13·2	1·22	1·43	3·0	2·1	82/32	7·9	4·3
Cardiff .. .. (225,600)	18·1	12·6	1·54	1·19	2·8	1·6	80/38	8·3	3·9

The death-rates of pre-school (1–5 years) children per 1000 births were: Hull 39, Cardiff 42.

Hull.

Dr. W. Allen Daley's report contains an account of an epidemic of poliomyelitis which we summarised on p. 705 of Oct. 6th. Of other infectious diseases diphtheria, as in 1926, was exceptionally prevalent; there were 747 notifications and 33 deaths. "The virulence of the disease," says Dr. Daley, "is increasing," and in one instance the three children affected in one family died. There is evidence that antitoxin is being given earlier and in more adequate doses. In September the offer of free immunisation was made. Of the three typhoid cases admitted to the city hospital, one was found to be a urinary carrier and discharged from hospital after a stay of five months, on condition that he should carry out a list of very stringent instructions.

The municipal houses erected since the war number 3342, 304 of which are on the North Hull estate outside the city. The types of houses are: 2281 parlour, 571 three-bedroomed non-parlour, and 490 two-bedroomed non-parlour. The demand for parlour houses is not maintained, and on the East Hull estate there were 35 parlour houses to let at the end of the year (rental 15*s.* 5*d.*). There is, however, a waiting-list of 1000 for the smaller type of municipal house let at 12*s.* 2*d.* to 13*s.* 6*d.* The most urgent need of the city is for houses to be let at an all-in rental of 6*s.* to 10*s.* per week to labourers and poorer artisans, who cannot afford to pay about 2*s.* per week for transport from the outskirts to their work. The corporation are now building exclusively non-parlour houses, and bricks are being used in preference to concrete or other method. The municipal programme comprises 4412 houses, and it is expected that another 970 will be added in 1928 to the 3342 already erected. The privy conversion scheme is expected to be completed in 1928. The work has been carried out with extraordinary rapidity. Up to the end of 1923 only about 2000 had been dealt with, and during the next four years over 30,000 of the estimated 40,000 conversions required were completed. There are still many courts, the houses of which are supplied with water from a common tap, and these are being dealt with. The new Smoke Act is being taken seriously, and since it came into operation the proprietors of 42 different works and premises have altered their plant in order to minimise the emission of smoke. At a number of other works the matter is under consideration. At the end of the year 1630 of the new municipal houses were fitted with "Cookanheat" apparatus, and 570 future houses will also be so fitted.

The average per head milk consumption of Hull is 0·41 pint. In comparison Manchester consumes 0·44, Bristol 0·41, Bradford 0·40, Cardiff 0·39, Newcastle 0·33, and Leeds 0·29 pints. Of 49 samples of outside milk examined for tubercle 5, or more than 10 per cent., were found to be infected. At the farms visited only one tuberculous udder was found, and in all the other cases cows had been disposed of after the taking of the sample, some of which were "suspicious." In one case the farmer was fined for failing to notify that he was in possession of a cow suffering from tuberculous emaciation. Among the 896 city cows no case of udder tubercle was found, but three suffered from tuberculous emaciation and were slaughtered under the Order.

Efforts are being made to reduce the mosquito nuisance and, up to the present, none of the anopheline type has been observed.

Dr. Daley says: "The most pressing public health problem remains almost unsolved—namely, the rehousing of the slum-dweller," but he indicates that the needs of the artisan, who can pay a moderate rent, have been almost met and that the task of tackling unhealthy areas can now be attempted. On one area a block of tenements was begun in 1927 and two new areas, comprising three acres and involving a population of 1116, were "represented."

Cardiff.

Dr. Ralph Picken records an advance all along the line. He deprecates the attempt to put a price on health and a money value on human lives. Treatment of sickness in Cardiff has been estimated to cost £200,000 and loss of wages from illness £150,000 annually. Unemployment alters the situation, and a life is only a monetary asset if it produces more wealth than it consumes. During the last six or seven years of declining trade and unemployment there is no clear evidence that the communal health has suffered, but it would be unwise to draw hasty conclusions, says Dr. Picken, as the less catastrophic forms of indigence are long in showing their effect.

A rheumatism supervisory centre is likely to be started soon as the result of bequests of money and of a building named Dulwich House, delightfully situated on Pen Hill at Llandaff. The number of school-children known to be suffering from severe heart disease and chorea is 212. An arrangement has been made with the Cardiff Royal Infirmary for keeping the records of the history, treatment, and progress of cases of cancer of the breast and uterus since Jan. 1st, 1926, and of the rectum since Jan. 1st, 1928. These records will become valuable as years go on. The percentage of deaths from pulmonary tuberculosis to all deaths between the ages of 16 and 25 was 21·6, an exceptionally high proportion in comparison with other towns, and one which shows over a long series of years a definite upward tendency. No real progress has been made in the provision of more adequate accommodation for advanced cases.

For two years there have been no deaths from scarlet fever. The case mortality from diphtheria was 4·3 per cent., and about 700 school-children underwent the full course of immunisation. There were three introductions of small-pox and six cases in all. The erection of the new small-pox hospital was hurried on in consequence and completed during the year. The accommodation for patients consists of a block with 10 cubicles, and a second block with accommodation for 21 patients in four wards, on a site just outside the city boundary. An increase in the new cases attending the venereal diseases clinics is noted, mainly due to the success of the special auxiliary clinic for women and children in association with the maternity and child welfare department. The excellent new laboratory, built in agreement with University College, was opened in June and serves the needs both of city and county; it houses the public analyst as well as the bacteriological department. A table shows what a large proportion of the infants and pre-school children attending the centres suffer from diseases or defects worthy of note. Thus, during 1927 832 out of 1941 infants and 215 out of 266 pre-school children so suffered. Another table shows the gradual increase of extra-domiciliary confinement from 13 cases per 1000 births in 1912 to 132 in 1927.

The amount of tubercle-free "graded" milk coming into the city daily is 193 gallons of Grade A (T.T.). Carefully collected information indicates that the great activity in house-building since the war has done little to relieve the congestion in working-class houses. A special house survey was made in October and November, 1927, including 3167 houses in which births occurred, 420 houses visited on account of tuberculous patients, and 297 houses visited in connexion with a rheumatic inquiry. A similar survey had been made in 1925. The comparison between the two surveys shows that the congestion in working-class homes is much greater in 1927 than it was in 1925, in spite of the fact that, taking the city as a whole, the average number of persons per house has been considerably lessened in recent years by house-building. The City Treasurer's report shows that the effective demand for houses of the type hitherto erected by the corporation has practically been met. It is difficult to avoid the conclusion, says Dr. Picken, that the demand would revive if houses of such a size and character were provided as could be let at a much lower rent than those which obtain at the present time.

The Port Sanitary Authority had a happily uneventful year. The school report records the opening of an open-air day school for 90 children; a more complete survey of crippled children; the continued success of ionisation treatment for ears; and an investigation which shows that the school meals provided are deficient in fat and vitamins and excessive in carbohydrate.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED OCT. 13TH, 1928.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 162 (last week, 130); scarlet fever, 2984 (last week, 2581); diphtheria, 1322; enteric fever, 73; pneumonia, 1153; puerperal fever, 44; puerperal pyrexia, 119; cerebro-spinal fever, 11; acute poliomyelitis 21; acute polio-encephalitis, 5; encephalitis lethargica, 20; dysentery, 9; ophthalmia neonatorum, 104. No case of cholera, plague, or typhus fever was notified during the week. The increase in scarlet fever is very general over the country.

The cases of small-pox were notified from the following 14 counties: Chester, 12; Derby, 28; Durham, 35; Essex, 6 (West Ham); Lancaster, 5 (Leigh); Leicester, 7 (county borough); Northampton, 5 (county borough); Nottingham, 9; Stafford, 10; Warwick, 3 (Coventry); Yorks, East Riding 1 (Hull), West Riding 22; Glamorgan, 17; Monmouth, 2. No cases were notified from the County of London or from Northumberland.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Oct. 16th–17th was as follows: Small-pox under treatment 9, under observation 1; scarlet fever, 2408; diphtheria, 1680; enteric fever, 46; measles, 72; whooping-cough, 261; puerperal fever, 22 (plus 16 babies); encephalitis lethargica, 70; poliomyelitis, 2; "other diseases," 15. At St. Margaret's Hospital there were 12 babies (plus 6 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 3 (1) from enteric fever, 14 (0) from measles, 12 (3) from scarlet fever, 23 (7) from whooping-cough, 21 (3) from diphtheria, 102 (35) from diarrhœa and enteritis under two years, and 61 (13) from influenza. The figures in parentheses are those for London itself.

The fatal cases of enteric fever outside London were reported from Birkenhead and Manchester. Four fatal cases of measles were reported from Birmingham, 3 fatal cases of whooping-cough from Leeds. The number of deaths from diarrhœa and enteritis has diminished further, but Liverpool has still 17 to report and Stoke-on-Trent 5. The number of stillbirths registered during the week in the great towns was 282 (corresponding to a rate of 44 per 1000 births), including 52 in London.

Medical News.

UNIVERSITY OF GLASGOW.—The following degrees were conferred on Oct. 20th:—

M.D.—*J. A. Kerr, *R. A. Lennie, *Olive M. Somerville, and J. W. Hamilton.

M.B., Ch.B.—*T. L. Chapman, *G. L. Montgomery, *J. S. McMillan, *Jack Yonace, *R. G. Miller, Thomas Anderson, T. H. Anderson, James Barr, Norman Bernstein, Donald Cameron, Ian Campbell, D. K. McI. Chalmers, Hugh Chapman, W. J. Christie, Mary C. Clark, J. E. H. Cogan, Edward Collier, Robert Cordiner, W. L. Cuthbert, Neil Douglas, G. S. Easton, Thomas Elliott, John Ferguson, W. J. L. Francis, J. B. Gayler, David Glen, R. E. Glen, Christina A. Greenshields, Elizabeth Grierson, Benjamin Guyer, D. McK. Hart, T. A. Haslett, D. M. Haugh, J. B. Henderson, J. A. Hill, John Jamieson, Elizabeth P. Macadam, Duncan Macartney, W. G. T. Macfie, A. M. Macgregor, Alexander MacInnes, Colin MacKenzie, William Mackie, George MacKinnon, H. R. MacLennan, Alexander Macnab, W. H. W. McWhirter, Alexander Miller, J. G. Miller, Mary E. Minihan, J. V. Ogilvie, W. L. Reid, E. A. Robertson, W. M. D. Robertson, J. A. Roughead, David Russell, T. S. Scott, James Simpson, Margaret O. Templeton, A. G. Thomson, James Tidd, John Trotter, Archibald Weir, Bessie L. M. Weir, C. H. Wilkie, and W. J. Woodward.

B.Sc. (with Second-class Honours in Pathology).—A. McN. Wyllie.

J. S. M. Robertson has been awarded the Brunton Memorial Prize, given to the most distinguished graduate in medicine of the year 1928.

G. L. Montgomery has been awarded the West of Scotland R.A.M.C. Memorial Prize.

* With commendation.

UNIVERSITY OF DUBLIN.—At recent examinations the following candidates were successful:—

FINAL EXAMINATION FOR M.B., B.CH.

Part I. Therapeutics, Medical Jurisprudence, Pathology, &c.—*E. S. Duthie, J. M. Gibbon, Arnold Rose, N. A. Kinnear, P. L. O'Neill, Reginald Bowesman, Charles Bowesman, Aaron Rakoff, and J. B. Scott.

* Passed on high marks.

In Completion.—D. G. McCaully, E. F. S. Morrison, and Charles Ryan.

MASTER IN OBSTETRIC SCIENCE.

A. A. Shafik.

UNIVERSITY OF EDINBURGH.—At a graduation ceremonial held on Oct. 20th the following degrees and diplomas were conferred:—

M.B., Ch.B.—Max Capcan and B. M. Melmed.

D.P.H.—Lucia L. C. Black, Elizabeth F. M. Clark, Edith E. Cromb, Isabel R. Gordon, Betty M. Kennedy, Mary V. Littlejohn, Ian M'Cracken, B. C. Mackay, Margaret M'D. Miller, A. L. K. Rankin, I. N. Sutherland, Violet B. Tulloch, and J. M. Watt.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—At a meeting of the College held on Oct. 17th Mr. Alexander Miles was re-elected President for the ensuing year, Dr. A. Logan Turner Vice-President, and Mr. John William Struthers, Secretary and Treasurer.

The following 27 successful candidates out of 78 entered who passed the requisite examinations on July 16th were admitted to the Fellowship:—

D. A. Abernethy, J. Bernstein, R. E. Buckingham, E. G. Collins, R. C. Craig, B. B. Cadgil, E. J. G. Glass, E. W. Hayward, H. T. Jenning, A. H. Johns, A. E. H. Kendall, A. M. Kulatilleke, G. H. Lee, J. E. S. Lee, D. A. P. Macalister, C. W. R. McCaldin, G. W. M. Paterson, G. Punshon, G. Purdy, W. L. Thomas, T. H. Thorp, V. G. H. Wallace, F. B. Walsh, E. P. Waters, A. H. Winchester, W. W. Woodhouse, and R. E. Yule.

ROYAL DENTAL HOSPITAL OF LONDON.—The annual dinner of this hospital was held on Oct. 20th at the Trocadero Restaurant. Mr. G. G. Campion took the chair, and among the guests were the Hon. Sir W. H. Goschen, chairman of the hospital, Dr. Charles Ripon, Sir Holburt Waring, Mr. W. H. Dolamore, and the Deans of the London and Middlesex Hospitals. After the loyal toasts, Sir W. Goschen proposed the health of past and present students, giving a survey of the life and times of William Harvey. Mr. S. B. Newton and Mr. H. W. Freeth replied for the students, and the Dean, commenting on the progress of the hospital and dental school, said that although the numbers were not quite as large as last year's (108 men, 8 women), the standards of achievement were well maintained. Over 60 per cent. of candidates had succeeded in the examinations, and one student was working for the B.D.S. degree of London University, a qualification for which the school was well able to prepare students. Replying to a suggestion that post-graduate courses should be arranged, he pointed out that courses already existed in radiology and anæsthetics; that general refresher courses would be difficult to hold, but given a sufficient demand would be provided. Mr. G. O. Whittaker proposed the health of the Chairman.

Surgeon-General Percy James Kelly has been appointed a member of the Executive Council of British Guiana.

ROYAL INSTITUTION OF GREAT BRITAIN.—Two lectures on the Mechanism of the Nerves will be given at 5.15 P.M. on Thursdays, Nov. 22nd and 29th, at 21, Albemarle-street, London, W., by Dr. E. D. Adrian, F.R.S.

Colonel Astley Vavasour Clarke, M.D. Camb., has been appointed a Deputy Lieutenant for the County of Leicester.

A CONVALESCENT HOSPITAL AT PRESTON.—A convalescent hospital for men, with 25 beds, has been opened in connexion with Preston Royal Infirmary. It is housed in The Willows, an adapted mansion, formerly the residence of Mr. W. W. Galloway, by whom it has been presented, together with the cost of the alterations and equipment. The house contains Adam and Queen Anne decorations, and the gardens are unusually attractive.

UNIVERSITY OF LONDON MEDICAL GRADUATES SOCIETY.—At the autumn dinner of this society, to be held on Wednesday, Oct. 31st, at 7.15 for 7.30 P.M., at the Langham Hotel, Portland-place, W., Prof. M. Hajek, of Vienna, will be the principal guest. The opportunity will be taken of giving members the latest information about the Bloomsbury site and its use by the University. Those intending to be present should obtain tickets from the hon. secretaries at 11, Chandos-street, W. 1, not later than Oct. 30th.

EXTENSION OF GLASGOW ROYAL INFIRMARY.—Sir John Gilmour, the Secretary for Scotland, has formally opened the last section of the reconstructed hospital. The final part of the scheme, which necessitated the demolition of the famous Lister Ward, has cost between £60,000 and £70,000, but the complete reconstruction, begun in 1905 and interrupted by the late war, has involved the expenditure of £650,000. Two new casualty wards, each for 16 patients, dedicated to the memory of Mr. John Ross, of Lochbrae, a generous benefactor of the institution, have been provided in this final section, together with a Lister Lecture Theatre holding 160 students, built on the site of the Lister Ward, with a commemorative inscription.

LIVERPOOL ANNUAL MEDICAL SERVICE.—This service, held in Liverpool Cathedral on Sunday, Oct. 14th, was attended by the Lord Mayor (Miss Margaret Beavan) and a large number of medical men and women of whom 60 were in robes and formed a procession. The sermon was preached by the Bishop of Liverpool, who dwelt on the importance of joining the spiritual and psychological with the medical in the processes of healing in accordance with Christ's double command to preach and to heal. He also spoke of the wrong attitude which some people had towards disease and pain. He considered that it was not God's will that people should suffer. The lessons were read by Dr. Murray Cairns and Dr. Bernard Chavasse, and a collection of about £97 was taken in aid of the Royal Medical Benevolent Fund.

LONDON HOSPITAL DINNER.—Dr. Lewis Smith presided over the annual dinner at the Trocadero Restaurant on Oct. 18th, when there was a large gathering of old students of the hospital. The guest of the evening was Lieut.-Colonel W. M. Pryor, chairman of the College Board, and messages were read from Lord Knutsford and others who were prevented from attending. After the loyal toast had been honoured, and the toast of H.M. The Queen as President of the Hospital, Dr. Lewis Smith gave a racy account of recent travels in various parts of the world, including Whitechapel. On a visit to the hospital he had ascertained that there were still two or three uncured members of the race which is dominant in that neighbourhood, and he had been lucky enough to meet many of those who were still working there. His description of their activities was much appreciated by the company, as also was the account he gave of London Hospital men whom he had met during a voyage round the world. It was very satisfactory, he said, to find in all sorts of remote places that there was always a London Hospital man, that he was making good, and that the memory of the hospital was a constant stimulus to the best possible work. Dr. Lewis Smith admitted that he had contracted severe "Imperialitis" as a result of the kindness and hospitality everywhere received. The health of the chairman was proposed by Dr. Russell Andrews, who spoke, as an old but discreet friend, of his admirable qualities as a fellow student, colleague, and holiday companion. The toast was drunk with great enthusiasm, and evoked a brief but entertaining response. The party then exchanged its symmetrical arrangement for one more in keeping with unrestricted conversation.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

THURSDAY, Nov. 1st.—8.15 P.M., TROPICAL DISEASES. Presidential Address: Dr. J. B. Christopherson: A National Outlook of Tropical Medicine. Paper by Dr. J. G. Willmore.

FRIDAY.—10.30 P.M. OTOLOGY. (Cases at 9.30 A.M.) Presidential Address by Mr. Somerville Hastings. Dr. J. Kerr Love: A Classification of Deafness Based on the Effect of Deafness on Efficiency in Life. Dr. T. A. Clarke: On Hearing Tests. Cases and specimens will be shown by the President, Mr. E. D. D. Davis, Mr. Norman Barnett, and Mr. H. Graham Hodgson. 5 P.M., LARYNGOLOGY. (Cases at 4 P.M.) Presidential Address by Mr H. Bell Tawse. Cases will be shown by Mr. Herbert Tilley, Mr. C. A. S. Ridout, Mr. H. Lawson Whale, Mr. W. M. Mollison, and Mr. Harold Kisch. 8.30 P.M., ANÆSTHETICS. Mr. I. W. Magill: Endotracheal Anæsthesia.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.

THURSDAY, Nov. 1st.—5 P.M., Dr. A. G. Gibson: Pyelitis and Pyelonephritis (Bradshaw Lecture).

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.

MONDAY, Oct. 29th.—5 P.M., Mr. T. W. P. Lawrence: Demonstrations of Surgical Specimens.

FRIDAY, Nov. 2nd.—5 P.M., Sir Arthur Keith: The Evolution of the Human Foot and its Bearing on Orthopædic Disorders of the Foot.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Oct. 29th, to SATURDAY, Nov. 3rd.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square. Lecture by Mr. [illegible] Pain in Pregnancy, on [illegible] DISEASES OF THE THRO[illegible] 2 P.M.: Clinical Demonstrations by Mr. [illegible] WELLCOME MUSEUM OF MEDICAL SCIENCE, 33, Gordon-street, W.C. Wed. at 4 P.M.: Demonstration by Dr. S. H. Daukes on Diet and Disease. The above are free. HAMPSTEAD GENERAL HOSPITAL, Haverstock Hill, N.W. Practitioners' Course for two weeks in medicine, surgery, and the special departments. 4.30 to 6 P.M. daily. Clinical Demonstrations and lectures.

UNIVERSITY OF LONDON, South Kensington.

MONDAY, Oct. 29th, to THURSDAY, Nov. 1st.—3.30 P.M., Second International Conference on Light and Heat in [illegible] Conference Programme on [illegible] Journal of Actinotherapy, [illegible] London, W.C.1.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, Oct. 29th.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Simmonds: Surgical Out-patients.

TUESDAY.—11 A.M., Mr. Endean: Venereal Diseases (demonstration). 2 P.M., Dr. Shaw: Medical Out-patients. 2 P.M., Mr. Hamblen Thomas: Throat, Nose and Ear Department.

WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. 2 P.M., Mr. Tyrrell Gray: Operations. 2.30 P.M., Mr. Donald Armour: Surgical Wards. 4.30 P.M., Dr. Trevor Davies: Gynæcological Diagnosis.

THURSDAY, Nov. 1st.—10 A.M., Dr. Grainger Stewart: Neurological Department. 2 P.M., Dr. Ironside: Medical Out-patients. 2 P.M., Mr. Bishop Harman: Eye Department.

FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department.

SATURDAY.—9 A.M., Mr. Vlasto: Operation on Throat, Nose and Ear. 9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Diseases of Children.

Daily, 10 A.M. to 5 P.M., Saturdays 10 A.M. to 12 noon. Medical and Surgical In-patients and Out-patients. Operations, Special Departments, Anæsthetic Course.

UNIVERSITY OF LONDON SEMON LECTURE.

THURSDAY, Nov. 1st.—5 P.M. (in the Barnes Hall of the Royal Society of Medicine), Prof. Markusz Hajek, of Vienna: Laryngo-Rhinology and General Medicine.

UNIVERSITY COLLEGE, Gower-street, W.C.

MONDAY, Oct. 29th.—5 P.M., Prof. E. B. Verney: Urinary Secretion. (Third lecture.)

FRIDAY, Nov. 2nd.—5 P.M., Prof. J. C. Drummond: Recent Work on Vitamins. (Fourth lecture.)

5.30 P.M., Dr. J. Owens, A.M.I.C.E.: Smoke Pollution of the Air and Public Health. (First of three public lectures.)

LONDON HOSPITAL MEDICAL COLLEGE.

FRIDAY, Nov. 2nd.—4.15 P.M. (in the Bearsted Clinical Theatre), Dr. Cecil Wall: Expectoration. (Schorstein Memorial Lecture.)

EAST LONDON HOSPITAL FOR CHILDREN, Glamis-road, Shadwell, E.

WEDNESDAY, Nov. 7th.—4 P.M., Clinical Demonstration on Nephritis in Childhood. Free to medical practitioners.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY, Nov. 1st.—4 P.M., Dr. Hutchison: The Dyspepsias of Childhood.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

TUESDAY, Oct. 30th.—3.15 P.M., Dr. E. G. B. Calvert: Modern Methods in Liver Disease.

ST. PAUL'S HOSPITAL POST-GRADUATE COURSE, Endell-street, W.C.

WEDNESDAY, Oct. 31st.—4.30 P.M., Mr. Claude Mills: Some Interesting Urological Cases.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Oct. 29th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin and Eye Clinics. Operations.

THURSDAY, Nov. 1st.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, Oct. 30th.—5 P.M., Dr. K. Sibley: Principles of Treatment. Local.

THURSDAY, Nov. 1st.—5 P.M., Dr. A. M. H. Gray: Streptococcal Infections.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.

TUESDAY, Oct. 30th.—4 P.M., Dr. A. T. Henderson (McGill University): Studies in Asthma and Related Diseases. (Third Harben Lecture.)

WEDNESDAY.—4 P.M., Dr. S. W. Fisher: Pains and Pleasures of a Miner's Life.

UNIVERSITY OF BRISTOL.

TUESDAY, Oct. 30th.—8.30 P.M., Dr. J. Odery Symes: The Relation of Erythema Nodosum to Tuberculosis and other Diseases. (Long Fox Memorial Lecture.)

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, Oct. 30th.—4.15 P.M., Mr. E. D. Telford: [illegible] Obliterans. [illegible] P.M., Prof. J. S. B. Stopford: [illegible]

ANCOATS HOSPITAL POST-GRADUATE LECTURES, Mill-street, Manchester.

THURSDAY, Nov. 1st.—3.45 P.M., Mr. Diggle: Minor Operations of the Ear, Nose and Throat.

Appointments.

DRAKE-BROCKMAN, R. E., M.R.C.S., L.R.C.P., has been appointed Medical Referee under the Workmen's Compensation Act for Clerkenwell County Court.

FULLER, C. B. S., M.D., B.Ch. Camb., M.R.C.P. Lond., Honorary Physician in Ordinary to the Royal Hampshire County Hospital, Winchester.

HANCOCK, A. C., M.B., B.S. Lond., D.P.H., D.P.M., Medical Superintendent, Kent County Mental Hospital, Barming Heath, Maidstone.

SMITH, H., M.B., Ch.B. N.U.I., Medical Officer of Health for the Rural District Council, Bury.

WALKER, G. F., M.D. Leeds, M.R.C.P. Lond., Medical Tutor in the University of Leeds.

St. Thomas's Hospital: ROBINSON, A. B., M.B., B.S. Lond., Resident Medical Officer, St. Thomas's Home; OPDIE, R., B.M., B.Ch. Oxf., Senior Casualty Officer, Medical; and TUCKETT, C. I., M.B., B.Chir. Camb., Senior Casualty Officer, Surgical.

Westminster Hospital: WELLS, H. G., L.R.C.P. Lond., M.R.C.S., and McLAREN, K. M., L.R.C.P. Lond., M.R.C.S., Resident House Physicians; EDWARDS, W., L.R.C.P. Lond., M.R.C.S., COOPER, T. V., L.R.C.P. Lond., M.R.C.S., and LESLIE-SPINKS, A. J., M.B., B.Ch. Oxf., Resident House Surgeons; BROWN, H., L.R.C.P. Lond., M.R.C.S., Resident Obstetric Assistant.

Surgeons under the Factory and Workshops Acts: RANKIN, A. K., M.B., Ch.B. Glasg. (Aspatria, Cumberland), and MACPHERSON, J. M., M.B., Ch.B. Glasg. (Loughor, Glamorgan).

Vacancies.

For further information refer to the advertisement columns.

Barnsley County Borough.—Asst. M.O., &c. £600.
Birmingham City.—M.O. for Maternity and Child Welfare. £600.
Birmingham, City Babies Hospital.—Res. M.O. At rate of £150.
Birmingham City Hospital, Little Bromwich.—Third Asst. M.O. £350.
Bury Infirmary.—Sen. H.S. Also 3rd H.S. At rate of £200 and £150 respectively.
Cancer Hospital, Fulham-road, S.W.—H.S. At rate of £100.
Cardiff, Prince of Wales' Hospital.—H.S. £120.
Central London Throat, Nose and Ear Hospital, Gray's Inn-road, W.C.—2nd Res. H.S. £75.
Charing Cross Hospital, W.C.—Res. M.O. £350.
Chester Royal Infirmary.—Honorary Surgeon.
Chesterfield Borough.—M.O.H. £900.
Chesterfield and North Derbyshire Royal Hospital.—Res. Surg. O. £300.
Croydon General Hospital.—Hon. Phys. for Diseases of the Skin.
Dumfries and [illegible] Med. Supt. £600.
East Ham Co [illegible]
Frimley, Hos [illegible] —Sen. and Jun. H.P.'s. At rate of £150 and £100 respectively.
Golden-square Throat, Nose and Ear Hospital, W.—H.S. £100.
Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Res. H.P. At rate of £100.
Huntingdon County Hospital.—H.S. At rate of £100.
Leicester Royal Infirmary.—2nd Res. Anæsthetist. At rate of £250.
Liverpool, Hahnemann Hospital.—Hon. Medical Officer for Light Department.
Lowestoft, St. Luke's Hospital.—2nd Asst. M.O. £550.
Manchester Royal Infirmary.—Sen. Asst. M.O. (Part-time). Also Jun. Asst. M.O. for Radiological Department. £105 and £350 respectively.
Mildmay Mission Hospital, Austin-street, Bethnal Green, E.—Jun. Res. M.O. £100.
National Hospital, Queen-square, W.C.—Registrar. £200.
Norwich, Norfolk and Norwich Hospital.—H.S. to Ear, Nose and Throat Department. £120.
Nottingham, General Hospital.—H.S. At rate of £150.
Nottinghamshire County Council.—Tuberculosis Officer. £750.
Penshurst, Kent, Cassel Hospital for Functional Nervous Disorders, Swaylands.—Jun. Res. M.O. £350.
Queen Mary's Hospital for the East End, Stratford, E.—Res. M.O. Also Hon. Dental S.
Queen's Hospital for Children, Hackney-road, E.—H.P., H.S., and Cas. O. Each at rate of £100.
Royal Eye Hospital, St. George's Circus, Southwark, S.E.—H.S. Also Asst. H.S. At rate of £150 and £100 respectively.
Royal Free Hospital, Gray's Inn-road, W.C.—Radium Officer (Part-time). £100.
St. Thomas's Hospital, S.E.—Asst. Pathologist. £150.
Salisbury General Infirmary.—Res. M.O. £150.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—Reg. £100.
Stroud, Glos., Stroud General Hospital.—H.S. £120.

The Chief Inspector of Factories announces a vacant appointment for a Certifying Factory Surgeon at Newnham (Gloucestershire).

The *Ministry of Labour for Northern Ireland* announces a vacancy for a Medical Referee under the Workmen's Compensation Act (Northern Ireland), for the County and City of Londonderry. Applications should reach the Ministry of Labour, Ormeau-avenue, Belfast, not later than Nov. 10th.

Births, Marriages, and Deaths.

BIRTHS.

TICEHURST.—On Oct. 20th, at Saxon House, Appledore, Kent, the wife of Dr. Claud B. Ticehurst, of a daughter.

MARRIAGES.

PENROSE—LEATHES.—On Oct. 17th, in London, Lionel S. Penrose, M.A., M.R.C.S., to Margaret Leathes, M.A., M.R.C.S., only daughter of Prof. J. B. Leathes, F.R.S., and Mrs. Leathes, of Manchester-road, Sheffield.

DEATHS.

MCNICKLE.—On Oct. 11th, at St. Thomas's Nursing Home, Andrew John McNickle, L.R.C.P. & S. Edin., of Harleyford-road, S.E.

ROUND.—On Oct. 11th, at "Purbrook," Crescent Wood-road, Sydenham Hill, S.E., John Cornwell Round, M.R.C.S., L.R.C.P., aged 63 years.

WEAKLEY.—On Oct. 18th, at Melbourne-road, Ilford, Dr. S. J. J. Weakley.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

OVERCROWDING AT SHEFFIELD INFIRMARY.—So seriously overcrowded is Sheffield Infirmary that in the children's ward patients are sleeping two in a bed, whilst in adult wards a number of patients have to sleep on beds made up on the floor. There is a waiting list of several hundred medical and surgical cases. A new infirmary is being built.

Notes, Comments, and Abstracts.

NERVOUS DISEASE AND ITS SIGNIFICANCE IN INDUSTRY.*

BY MILLAIS CULPIN, M.D. LOND., F.R.C.S. ENG.,
LECTURER IN PSYCHONEUROSES AT THE LONDON HOSPITAL.

I TAKE as an introduction to this paper some sentences from that read at your last conference by Miss G. F. McArthur, who spoke of "nervous complaints which comprise a group of disabling sicknesses arising from no structural cause that can be detected, but which express themselves in weakness, instability, or exhaustion of the nervous system." She went on to refer to the cost to industry of this group and its effect in impairing mental and physical efficiency, and added that "a close scrutiny of the incidence of neurasthenia, nervous breakdown, nervous depression, and nervous exhaustion will reveal that these complaints are associated with fatigue, anxiety, monotony, incompatible work, insufficient rest, and perhaps with unduly severe or unsympathetic supervision."

These words refer to conditions but little understood and, in spite of their prevalence, neglected in the health propaganda that is now rightly popular. Their extent can only be guessed at. The medical officer of one large firm wrote to me about "the total of vague illness in which I include anæmia, gastric, neurasthenia, nerves and general debility," and this should be compared with Miss McArthur's reference to "anæmia, debility, and nervous complaints; a family of relevant disabling causes which are most directly aggravated, if not directly induced, by the conditions under which work is done." I must, however, criticise her remarks that "anæmia, for example, is a sickness definitely associated with an insufficient absorption of oxygen, with inappropriate or inadequate diet, with close confinement in bad air, with bad natural lighting, and with lack of sunshine and outdoor exercise to counteract the effects of occupation." Anæmia, or chlorosis, was in my student days a common and well-defined condition marked by a loss of the colouring matter of the blood, most frequent among ill-fed and overworked girls in large towns, but seen also under other conditions. There are other comparatively uncommon forms of anæmia, but this one has completely disappeared—why, we cannot say. The anæmia of our sick returns corresponds to no definite picture; it generally means only that the patient looks and feels ill. Sick returns show large numbers of cases in which the diagnosis is obviously based upon no definite evidence of physical illness, and since nervous illness usually presents no physical signs it is often to be looked for among these cases. Bearing this in mind, we will now glance at some of the few available figures.

Dr. Letitia Fairfield, in a paper in THE LANCET (1926, ii., 5–10), showed that over one-fourth of all long sick leave in a large group of female school teachers was due to these nervous disorders and, for the reasons given above, this must be considered as a minimum. From the annual sickness records of one firm I will read you the details of seven cases out of the first twelve:—

	Days lost.
Influenza, influenzal debility, nervous debility, nervous exhaustion, influenza	159†
Nervous debility	124
Dyspepsia and nervous debility	278
Cardiac and nervous overstrain	109
General debility	105
Debility	94
Nervous breakdown	123

† In separate periods.

These seven, out of the total of 12, come under the head of "nervous" or "debility." Any series of 12 would give the same general picture. The workers were reasonably well paid, their working conditions were hygienic, and I do not think they were excessively driven at their work. Their days lost per head per annum from sickness were 7·7 for men and 14·1 for women.

In another firm, with a sick-rate of 3·6 days for men and women, these nervous conditions were quite absent except for two cases of influenza where the length of illness suggested a possible nervous element. The difference in days lost was due almost entirely to the group of "debility and nervous."

A disconcerting feature is that these illnesses are, contrary to a priori beliefs, not characteristic of firms where hygienic conditions are bad or where work is strenuous. The highest sick-rate I know is in an establishment that rightly prides itself upon its care for the welfare of the workers; the lowest is in a large general store where conditions are

* A lecture delivered at the Conference of the Industrial Welfare Society, Balliol College, Oxford, on Sept. 8th, 1928.

reasonable but which has a reputation for getting plenty of work out of its employees. I am assured, however, that the low sickness-rate is not due to harshness. These two firms offer a curious contrast in one particular illness. Dysmenorrhœa, or painful menstruation, is a disorder with, usually, no objective evidence for its existence and is now coming to be regarded as belonging to our group of nervous illness. The general sick-rates are, roughly, 15 days for females in firm A and 2·6 for both sexes together in firm B. In firm A 14·9 per cent. of their high sick-rate is due to dysmenorrhœa; firm B, at my request, took out the figures for dysmenorrhœa and, by adding in the hours spent in the sickroom, brought up the total to from ½ to 1 per cent. of their low sick-rate. Doubling this, since about only half the staff are women, a little calculation shows, in spite of some difficulty in the figures, that firm A has about 40 times the sickness from dysmenorrhœa that firm B has.

We have, then, conditions called neurasthenia, nervous breakdown, nervous debility, and such like, and in addition a group of ill-defined conditions appearing under other names but really identical with these or dependent upon them.

What is Nervous Illness?

We use a vocabulary based upon the belief that in these conditions our nerves are "out of order." But we know nothing in this connexion about the state of those anatomical structures called nerves, and our phraseology is metaphysical. We live and have our being through our nervous system, and we must believe that every thought, impulse, or emotion is related to something happening in that nervous system. But when we consider the behaviour of an individual we think of various thoughts, feelings, and desires that we recognise in ourselves and assume in others, and the disorders we are discussing can be usefully considered only as alterations in the behaviour or feelings of the person as a whole; not as hypothetical changes in some of his anatomical constituents. There is involved here no antithesis between body and mind; bodily conditions can influence mental states, and mental states can influence bodily function.

This latter process needs emphasis. Some may have experienced fear or apprehension and may recall the beating heart, the dry mouth, the rapid breathing, and the abdominal discomfort, or, if the situation were prolonged rather than acute, the loss of appetite and sleep, the incapacity for bodily or mental exertion, and the sense of physical ill-being. The bodily expression of the emotions is not always, and is never only, a matter of muscular activity; its constant elements are changes in the activity of our glandular and other organs. The "gastric" group in sick returns includes such changes, and many people, young and old but mostly young, nurse as weak hearts organs that are only emotionally disturbed. There are obvious physical illnesses, including asthma, mucous colitis, and some skin disorders, in which some of us suspect an emotional basis; but this is beside our subject.)

It will be realised, when I give actual examples, that what we call nervousness is to a great extent a liability to experience the emotion of fear in circumstances that should not arouse that emotion. The chapter in Samuel Butler's "Erewhon" will be remembered where he describes the stigma attached to bodily disease, and the very guarded way in which the local practitioners approach the possibility of there being perhaps a slight physical disturbance to account for the patient's symptoms. To us, of course, inexplicable nervousness is shameful, whilst an inexplicable bodily symptom calls for sympathy and attention. Hence the nervous subject tends to seek refuge from our judgments in the physical symptoms that his nervousness provides. Further than this, he frequently avoids his own judgment by denying to himself the existence of fears or emotional stress so long as his physical symptoms enable him to escape the situation that arouses them.

We take for granted that a man knows little about what goes on inside his body; but we have assumed that we know all that takes place in our minds, and we dislike to admit that our thoughts or feelings or emotional reactions are not wittingly determined by ourselves. It is now believed, and the belief is not the result of theorising but of investigation, that complicated mental processes take place in all of us that are not accompanied by awareness. The reactions of the nervous subject are determined by such processes, and only this knowledge can make intelligible his apparently irrational and meaningless symptoms. This knowledge also warns us that to measure them by the standards of consciously motivated behaviour is futile.

I must in fairness present the theories that attribute these conditions to primarily physical causes. They appear in several forms. The simplest attributes nervousness to some actual disease, the absorption of poisons, for example, from an unsuspected focus of infection. There is this much in its favour, that any bodily discomfort, especially the general malaise that arises from such causes, adds weight to nervous symptoms that might otherwise lead to little discomfort. A nervous patient with a focus of infection should have it treated; and so should a patient who is not nervous. The next form of theory postulates changes in those endocrine glands about which we have in recent years learnt a great deal and speculated still more. They are concerned with temperament and emotion and it is possible that a primary disturbance of them may render emotional reactions unstable. But experiment and experience—particularly war experience—show that emotion affects the glands rather than that the glands affect emotion. Moreover, nervous fear is specific—a man may fear to cross a field alone and yet deal effectively and calmly with real danger, so that it is plain that here there is no general tendency to feel fear such as would arise from excess or deficiency of glandular activity.

Yet another form of the physical theory is associated with the name of Adler, who believes that some parts of the body are poorly developed and that this inferiority leads to symptoms arising from the organs concerned. This "organ inferiority" is perhaps a part of the picture in some cases. Least useful is the belief about our nerves being out of order, by which we avoid so many difficulties.

Certain outside influences are assumed to cause nervous illness and call for brief criticism. Overwork and strain stand first in the popular belief, but I agree with Dr. Fairfield, who, in the paper already quoted, shows by actual cases that the easy acceptance of such explanations hides the fact that these causes by themselves are harmless. Physical fatigue, even when severe, is quickly recovered from, but we see cases in which an ordinary vocation is supposed to produce states of exhaustion that need months for recovery. Hard work never caused nervous breakdown; the words overwork and overstrain really refer, not to the work, but to the reaction of the subject in regard to it. Worry is another word that, taken to refer to outside factors, really indicates something arising within the subject; the nervous subject must worry because he is nervous, he is not nervous because he worries. Monotony is another scapegoat, but whenever I seek for the meaning of the word I find that it refers not simply to repetitive work—which is agreeable to many people—but to repetitive work that is distasteful. Noise is receiving attention now and many letters have appeared in the press claiming that it causes nervous breakdown. Of that there is no evidence, and on systematic questioning I find that the man who protests about noise presents other nervous symptoms. The emotionally stable man can adjust to noise very quickly. All we know is that to some nervous people some noises are very distressing; that may be a sound argument for diminishing noise—I hate some noises myself—but that by some direct action upon nerves it causes breakdown is a speculation outside the realms of physiology.

I do not suggest that we should not eliminate overwork, monotony, and noise; they are disagreeable things and serve as pegs upon which the nervous subject hangs his symptoms. But there is no evidence that occupations in which these factors play a part show a higher nervous sick-rate than others, and there is at least some evidence in the contrary direction.

In order to complete this survey I will add that I regard nervous states as having their origin in those early years of life in which our character traits and emotional modes of reaction are determined. If they mature as illness it is because of some difficulty in emotional adjustment to the demands of life.

The Incidence of Nervousness.

In the absence of systematised information about the prevalence of nervous illness, the Industrial Fatigue Research Board has arranged an investigation in the course of which I have, in collaboration with Miss May Smith, interviewed over a thousand volunteers, workers in various occupations, with the aim of learning what we can about nervous illness in industry. Here is an example of what can be learnt in a 20 minutes' interview:—

Female clerk aged 33. Dislikes the work. A month ago was away for nerves. Had made a mistake and it worried her. Always had feared the dark or being alone. Nervous if spoken to by strangers. Cinemas try her eyes. Has good and bad days; no energy, but improves as the day goes on. Has a feeling of "something awful going to happen—a cloud." Tennis is too much for her; influenza left her heart weak. (Asked how that showed itself—goes faint in trains or crowds.) Could not sit in a small room like this; it would make her come over all faint. No, not frightened at all; its the heart. Wears glasses (0·25 plus cylinders) to avoid strain and headache. Had all her teeth out for gastritis before the age of 21. Does not look forward to keeping on at this work.

We see here the influence of nervousness upon physical symptoms. The gastritis is the "gastric" of my medical correspondent. The heart symptoms are the result of emotion; her inability to sit in a small room is what is called claustrophobia, but the fear is disguised as a heart symptom. The wearing of very weak glasses for eyestrain is a hallmark of the nervous subject. All her physical troubles are excrescences upon a basic nervousness, and the history is so typical of what can be obtained from sufferers

from nervous breakdown that it is very probable that a nervous breakdown will be her fate. Meanwhile her work suffers and she adds to the already high sick-rate of her firm.

The next case, though showing symptoms equally severe, is a curious contrast from the industrial aspect:—

Female laundry worker, aged 34, married, four children. Likes the work very much. Would not change if given the chance. "My nerves are all bad. The least worry makes me go all of a shake. I worry at the least thing. I'm afraid in the dark or of being alone. Wouldn't go along a dark road." Describes claustrophobia. "Should worry and fidget in this room." Never goes in a bus; wouldn't go alone in a train; feeling of being observed; never goes out by herself. She has to find a companion to accompany her to work. A summons to see the manager would make her go all hot. "All of us have been born with nervous debility." Never goes to the pictures. Is asocial.

Here you see no camouflage. The nervous symptoms appear frankly as such; but the woman is an efficient worker, she has no sick leave from nervous illness and her employers have no suspicion that she is different from other people.

These two examples demonstrate one important principle: nervous symptoms need not mean industrial disability. The first subject is in an occupation with fair security of tenure, with the ordinary pay of clerical work, short hours, and hygienic surroundings. The second is in an ordinary laundry; her hours are longer; one would say her surroundings are less hygienic, they are certainly less up to date than the other's; she works subject to a week's notice, and has the cares of a household in addition to her work.

Laundry workers show as high a percentage of nervous people as clerical workers in private firms or Government employ; but the incidence of nervous illness in two laundries investigated is so low as to be incalculable. One factor may be the satisfaction of the workers with the work. I start my interviews with the question, "How do you like your work?" and the answers to this conversational gambit provide, so far, the only definite correlation with the incidence of nervous disability. In the laundries over 90 per cent. declare they would not change their occupation if they had the chance; in clerical occupations the percentage varies from 54 to 84. In only one establishment was everyone satisfied; that was a school of dramatic art where in the nature of things choice had been free, free even from effective economic pressure. Only 32 per cent. of the students failed to reveal symptoms at the interview and 25 per cent. were assessed at high figures—we have all heard about the artistic temperament, and now I know what it is as expressed in symptoms. No sickness records were kept, but I could find no hint of absence through nervous illness. The nervous breakdowns will come later, when life has become strenuous.

What is the prevalence of nervous symptoms? This is hard to say, for one cannot obtain an experimental group representative of the general population. The element of personal judgment, too, is sure to enter, but my findings have been checked by Miss May Smith, working with the McDougall-Schuster dotting machine, which is an objective test giving results in general agreement with my own, though in individuals they are not sufficiently uniform to be used independently. I find that I pass as free from symptoms less than 50 per cent. of my subjects, about 25 per cent. have one or two minor symptoms, another 25 per cent. have symptoms that interfere with happiness or efficiency, and from 5 to 10 per cent. are seriously in need of treatment. In a few cases I have suspected that the subject was on guard against revealing what he might consider his weaknesses, and this suspicion has invariably been confirmed by a poor performance at the dotting test. On the other hand, I am often thanked for listening to troubles that the sufferer has hitherto kept secret and perhaps exaggerated in importance. It is always understood that the interview is confidential.

Temperamental Qualities Affecting Efficiency.

If the occupational environment is favourable, symptoms may have no direct relation with efficiency; our laundry woman's fears, for example, did not interfere with the day's work. But some nervous tendencies have a direct effect upon work, or, what is perhaps more important, upon relations with fellow workers, subordinates, or superiors. It will be remembered that one case-history made mention of "good and bad days." Perhaps most of us have days when, as the old saying puts it, we seem to have got out of bed the wrong side, and in the nervous subject these "bad days" are often marked by the feeling of impending disaster, though objectively they are characterised by obvious irritability and uncertainty of emotional reaction. Sometimes they affect the quality and quantity of the work done, and actual records showing work curves in nervous people have demonstrated this effect.

A dislike to being watched causes embarrassment and discomfort. A clinic patient of mine told me how, when engaged at polishing the inside of aluminium horns for loud speakers, he said to a foreman, "If you stand and watch me like that there will be an accident." The foreman reported him for impudence, but the manager—whose insight suggests some nervous symptoms in himself—accepted the man's explanation and ordered that the foreman should refrain from watching him. This dislike is more common and intense than might be suspected; there are men apparently quite ordinary who will rather go hungry than enter a teashop alone because of the feeling that all eyes are upon them. An impulse to rush one's actions may have a relation to accidents. One patient assured me that he knew he would break his neck some day whilst cycling, because of such an impulse. Among his other symptoms was telegraphists' cramp, which was largely determined by this inability to "take his time over it."

Scrupulousness, whilst estimable within limits, is carried sometimes to extremes and appears as fuss or worry. A constant and harassing fear of mistakes leads to mistakes and unnecessary repetition of work; worrying as to the opinion of others fetters action and judgment. Self-criticism passes on to uncertainty, till in extreme forms the subject is tormented with an inability to believe that he has done what he knows he has done. Unfortunately, this over-scrupulousness does not diminish with age and what may have been a useful, though not unmixed, quality in a subordinate becomes a nuisance when the afflicted one reaches a position of authority. We have had a practical demonstration that a personal factor of that nature can affect sickness-rates in subordinates. Here let me observe that in this nervous world of ours the absence of nervousness in a principal, if accompanied by a misunderstanding of and contempt for the nervous ones, may be as disastrous. A mild degree of nervousness, if accompanied by insight, may actually be an advantage in handling people.

There is one interesting type called "obsessional" in which the symptoms are primarily on the intellectual level rather than the emotional. (The word *obsession* has here a specific meaning different from the loose meaning popularly given to it. It indicates a compulsion recognised by the patient as irrational.) These people may appear quite free from symptoms, even to their intimates, or may be regarded as highly strung. They are often remarkably efficient, standing out from other people by their performances at the dotting test, in which they excel the humdrum folk who are free from symptoms. They may be tinged with over-scrupulousness and they sometimes suffer from anomalous physical symptoms—I should expect them to be subject to troubles like writer's cramp—and of course nervous breakdowns come their way. They reach high positions but, I think, stop short of the highest. As an example of obsessional symptoms I will mention a girl of 20, tall and a fine physical specimen, who said, "I dissect my actions and then dissect the dissection. Its a vicious circle till I nearly go mad. I try but can't stop." In another case a man gave up playing chess because of an obsession so to arrange himself in relation to other people that their relative positions formed the knight's move. This man made an outstanding record at the dotting test, which has been approached only by a fellow obsessional; it was far and away superior to the dotting of any non-nervous person.

But I wish on this occasion to stress the unity of nervous states rather than their clinical varieties. Let me build a composite picture: A man who has always been afraid in the dark; who says he was put off games at school because of his heart, but is now passed as a first-class life; who goes all of a shake if the manager sends for him; who sometimes has a feeling that something dreadful is going to happen but does not know what; who suffered from nervous debility for three months after influenza; who cannot bear to sit in the first row of the gallery at a theatre; and, finally, makes a bad show at the dotting test. He is perhaps carrying on his work without anyone suspecting his nervous condition. But if he became a soldier and went up the line he would have shell-shock; at the base he would suffer from gastritis or a strained heart; if he were a workman and met with an accident he would suffer from traumatic neurasthenia; if a business man and life became too difficult he would have a nervous breakdown; if a telegraphist he would develop cramp; if a miner he would have nystagmus and become a subject for compensation. The form and title of the symptoms would be determined by fortuitous circumstances, but the foundation would always be the same. He could only come through without serious trouble if life ran smoothly. And for some nervous people life never can run smoothly.

The Dilemma in Handling Nervous Disability.

When dealing with cases of shell-shock I came to the belief that every man, if exposed indefinitely to modern warfare, would reach breaking-point; but a statistical study of 150 cases showed a close relation between the degree of predisposition, as revealed by the search for antecedent symptoms, and the length of service before breaking-point was reached. In civil life we meet the same two factors—

predisposition and stimulus; bear in mind that predisposition is a difficulty in adapting to the demands of life and that the outbreak of disabling symptoms is a failure of the attempt to adapt.

I have not yet considered the point of view indicated by the subtle condemnation implied in such a word as *neurotic*, from which the nervous subject is regarded as being in some way responsible for his symptoms. There is this much truth in it, that the disability rescues the subject from the stimulus that produced it; in the case of shell-shock the rescue was so obvious that to the tough-minded shell shock, as soon as its mental nature was recognised, was only malingering. The nervous subject is not aware that one factor in his illness is the escape from an intolerable position. Moreover, the position is intolerable not necessarily for material reasons but because the man is already nervous; something is hitting him and he does not know what. The man who knowingly feigns a disability to escape the materially intolerable, discards the symptom when he succeeds. The nervous man finds an ordinary situation of life intolerable, is rescued from it by an exacerbation of his symptoms, and may remain ill and unhappy.

We have to regard the escape from some stress as a factor in nervous disability. If we make the way of escape easy we introduce another mental process that aids the development and perpetuation of symptoms. Yet the sense of duty may be stronger in the nervous than in the healthy—I have already described over-scrupulousness as a nervous symptom. Many nervous folk carry on under great difficulties, but others are ready to throw in their hands at the first opportunity. If upon every nervous patient were forced the alternatives of work or starvation, many who now succumb would find salvation in work; but others would starve and some might find a speedier end. Every case is a special problem, and I am now taking only one aspect, which is not always present; plenty of cases exist apart from any question of work, but we are faced by the difficulty that the nervous subject needs help and may be unable to work on account of his symptoms, whilst if we make easy the escape from effort—whether by sick pay or compensation—we may perpetuate the trouble in the individual and increase it in the mass.

This aspect is important in what are called the occupational neuroses. Miner's nystagmus, in my opinion, belongs to this group, and it has increased alarmingly of late years till the annual amount now paid in compensation is over half a million. That the influence of compensation is becoming recognised is shown by statements made in the House of Commons by Dr. Vernon Davies on July 11th last. He noted that the figures were going up in this country, where compensation lasts indefinitely, but that there was not the same rate of increase in Belgium, where compensation ceased after a definite period and for some remarkable reason the patients then improved.

The Handling of the Nervous Individual.

If my point of view is correct, the commonly assumed causes of nervous illness lose much of their significance and each case becomes a problem of personal adjustment. As in physical disease, the influence of working conditions may be less than that of home conditions, for domestic and family life call for even more adjustment than the working life. Every case is a special problem and the welfare worker may be in a better position to help than the doctor. That help must be guided by understanding, and the first essential is the recognition that nervous symptoms are not the result of "imagination" but, as far as the sufferer is concerned, are as real as toothache. One must be prepared to listen to absurd symptoms, to stories of apparently unreasonable emotional reactions, and to listen without expressing moral or intellectual judgment; and that means without feeling it, for the over-sensitive subject is quick to sense judgment and to withhold confidence if he detects it. The telling of nervous symptoms hitherto concealed does good—never harm—and paves the way to the discovery of current stress which, however, as a cause of his trouble, the patient tends to put in the background in favour of some of the more popular explanations. The recognition by the patient that his illness is an emotional reaction against some stress is often enough to end it; but the question may arise how far he should be encouraged to ignore his symptoms and carry on, or what material concessions should be made; certainly any concessions that would be reasonable in the case of a healthy man. The matter of sick leave is the concern of the doctor, but sick leave without an attempt to find out the why of the maladjustment is a mistake.

These principles will serve in many cases. There will remain others where the nervous reactions are of too severe a nature to be handled without more specialised knowledge.

Conclusion.

Work upon this subject is only beginning and easy explanations and solutions are dangerous. So many of my own ideas have been falsified that I hardly like to express opinions that await confirmation. I will offer one generalisation: rigidity of conditions of employment appears to favour the outbreak of nervous disability. That effect of rigidity seems likely if difficulty of adaptation is the key to nervous illness, and the supposition is to some extent justified by our findings. We already treat as a truism the proposition that the happiness and contentment of the worker depend upon physical health; but body and mind are perhaps only two aspects of one vital process, and it should be a truism that the physical health of the worker depends upon happiness and contentment. In the nervous subject happiness and contentment are difficult of attainment, and we may find in his reactions a delicate indicator of unsuspected evils that may be affecting his fellows in a less degree.

IMMUNISING DOGS AGAINST RABIES.

IT was mentioned in the *Times* of Oct. 17th that a large Alsatian, owned by a European, recently developed rabies at Mussoorie, and that several persons who had been bitten by the dog were sent to the Pasteur Institute at Kasauli. The collector has announced that all dogs at large unmuzzled shall be immediately destroyed. In this connexion it is interesting to learn from the *Military Surgeon* for September (p. 435) that the Adjutant-General, on the recommendation of the Surgeon-General, has directed that, during the next ten years, all dogs kept on nine military reservations shall be yearly immunised against rabies by a veterinary officer, at the expense of army funds, in order to determine definitely what benefit is to be derived from canine immunisation. In one of these reservations in 1927 15 persons were bitten by rabid dogs.

CORED CARBON ARCS.

THE cored carbon electrode is a hard carbon rod with a central core containing one or more metallic compounds. In the heat of the arc this metallic filling is volatilised and the radiation emitted contains a spectrum characteristic of the metals present in addition to that of the normal carbon arc. Cored carbons are usually cheaper if used in preference to the corresponding metallic electrodes as they are steadier and as a rule more economical in running. A variety of these electrodes is now available and these differ considerably from one another in the quality of the radiation emitted, some being rich in the short wave-lengths of the extreme ultra-violet, others in the region nearer to the visible spectrum. It is to be hoped that the special therapeutic properties which characterise these different types of radiation may be more definitely established. The Electrical Equipment and Carbon Co., Ltd., have published a leaflet showing the spectra of some 14 varieties of cored carbons made by Messrs. Siemens. In judging their importance it must be borne in mind how greatly the appearance of the photograph of a spectrum can be modified by variations in photographic technique. The photographer's task is here very difficult owing to the immense range of intensities between the strongest and the weakest lines, exaggerated by prolonged development, which no printing paper can render. The print therefore is apt to show groups of strong lines lacking in detail, whilst the fainter lines are lost altogether. Spectra which are to be compared should be recorded on one plate and subjected to the same technique. With cored carbon electrodes in particular the electrical conditions are also of primary importance. If the arc is arranged to consume a small current, the temperature may not be high enough to volatilise the core to any marked degree, especially if it contains metals of high melting points. Again, the radiation from the incandescent electrodes differs greatly from that from the flame of the arc itself where the volatilised core has most effect, so that if the spectrometer has been focused on an electrode rather than on the centre of the arc the spectrum obtained will not do justice to the electrodes under test. Perhaps this may explain the great similarity in the leaflet between the spectrum of tungsten-cored carbon and that of pure carbon. In actual use they are very different.

OUR attention has been called to the programme of a ball given at a West-End hotel in aid of a special hospital, on one page of which are set out the names and addresses of the honorary medical staff of the hospital. We are authorised to state that the staff was not consulted as to the form of the announcement, and would not have allowed their addresses to be so given.

HOSPITAL TICKETS AT RUGBY.—As a consequence of the adoption of the penny-in-the-pound scheme it has been decided to abolish tickets of recommendation to Rugby Hospital. It has been found that the existence of the ticket system deters a certain number of people from joining the scheme.

Bradshaw Lecture

ON

PYELITIS AND PYELONEPHRITIS.

Delivered before the Royal College of Physicians of London on Nov. 1st, 1928,

BY ALEXANDER GEORGE GIBSON, D.M. OXF.,

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THE purulent and semipurulent infections of the kidney are met with in many departments of medical work: they are frequent in general practice; they complicate pregnancy and delay recovery from surgical operations. They are disorders treated by specialists and general practitioners alike. But there is considerable divergence in views on the anatomical lesions which correspond to our clinical types of disease, and until the pathological basis of these infections of the kidney is settled treatment may be imperfect. It is my purpose to attempt to bring some sort of order out of what appears to be discordant. It will be necessary first to review the experimental evidence of the behaviour of the kidney to infecting agents, and later to see how far these views can be borne out by evidence from human disease.

BEHAVIOUR OF THE KIDNEY TO INFECTIONS IN BLOOD STREAM.

There is a long series of papers by various writers which demonstrate clearly that pathogenic organisms of various types can pass through the kidney, experimentally, without any damage or with but microscopic damage to the kidney substance. This has been proved for *B. typhosus*, for *B. coli*,[1] for *Staphylococcus aureus*,[2] for *B. tuberculosis*,[3] for mould spores,[4] and for *B. lepræ*,[5] to mention but a few of the organisms with which experiments have been made. The experiments of Thiele and Embleton[6] demonstrate that organisms are excreted within half an hour of being injected into a serous cavity such as the peritoneum; inert substances such as carmine appears within ten minutes. The presence, therefore, of even a virulent organism in the blood has no certain power of infecting the kidney. In the experiments of Helmholz and Beeler[7] 8 only out of 66 animals whose blood stream was directly injected with the *Bacillus coli* from human cases of pyelitis showed lesions of the kidney; when the pneumococcus was mixed with *B. coli* lesions of the kidney were seen in 4 out of 11 animals injected. Moreover, when the *B. coli* was isolated from a catheterised specimen of urine from an animal under a similar experiment, 22 out of 32 animals injected intravenously showed kidney lesions. Passage therefore augments virulence. Helmholz, Millikin, and Field,[8] however, in a later paper suggest that "the normal renal filter does not permit bacteria injected intravenously to pass through into the urine until local changes are produced." If this means that a microscopic breach in a cellular membrane is necessary for this passage, it may be true, but to assert that there is gross damage, such as might ultimately interfere with kidney function, is at variance with many facts of clinical medicine and pathological anatomy. Examples of this are common, virulent puerperal infections occur with positive blood and urine cultures without more gross kidney damage than cloudy swelling. Typhoid bacilluria does not invariably produce kidney damage. Streptococci of various types and *B. coli* may be found in catheter specimens of the urine of normal persons in amounts that could not be due to contaminations. Thiele and Embleton's[9] experiments in 1913 prove that the route taken by organisms injected into the peritoneum is by the thoracic duct into the blood stream and thence to the kidney.

In a series of experiments by Bumpus and Meisser[10] it was shown that cultures of green-producing streptococci (*S. viridans*) obtained from the devitalised teeth or tonsils of patients suffering from pyelitis, when injected into the veins of rabbits, produced kidney lesions in 76 per cent., a higher percentage than affections of any other organ. Similar experiments with *B. coli* isolated from the urine of patients with pyelitis have been uniformly unsuccessful, and the authors conclude that this organism is of secondary importance compared with the streptococcus. They found that the affinity of an organism which had already infected the kidney was specific, for while 22 of the 32 animals under experiment had lesions of the kidney, only three had lesions of other organs—namely, of the peritoneum, epididymis, and cæcum. Lepper[11] obtained microscopic lesions of the kidney from intravenous injections of *B. coli* in four out of five cases, the inflammatory changes being confined almost entirely to the papilla of the kidney. This author confirmed what had already been proved, that interference with the passage of urine into the bladder by tying the ureter greatly increases the chance of infecting the kidney by intravenous injections of *B. coli*.

In Helmholz and Beeler's[7] series of 32 animals injected intravenously with *B. coli*, 16 showed pyelitis; in ten of these there were also kidney abscesses. In a subsequent paper Helmholz[12] reported a series of ten experiments on rabbits in which the kidneys were infected by the intravenous route; they comprised six cortical abscesses, three medullary abscesses, six cortical and medullary abscesses, and four leucocytic accumulations in the capillaries of the papilla, mainly therefore infections of the kidney substance.

Schmidt and Aschoff[13] require for the proof of a blood infection the presence of a clear focus of infection or source from which such infection could have come. Clinical experience, however, can provide numerous instances in which some trivial infection is followed by pyuria without the slightest evidence of disease or irritation of the lower urinary channels. They assert that even the triangular so-called septic infarct is not due to a blood infection, that it does not lie in connexion with a section of the vascular system of the kidney, but is related to one group of collecting tubules.

BEHAVIOUR OF THE KIDNEY TO INFECTIONS REACHING IT FROM BELOW.

In the matter of experimental ascending infection of the urinary tract there is some disagreement, and from an enormous literature it is possible only to quote the most significant. In 1917 Helmholz and Beeler[7] reported that pyelitis was found in 9 out of 15 animals which had received injections of *B. coli* into the bladder. Helmholz[7] analysed the lesions of 13 kidneys from animals which had been similarly infected; 12 had pyelitis (pelvic inflammation); 6 had diffuse inflammation of the papilla such as is more frequently seen in hæmatogenous infections; 1 had a group of cortical abscesses, and in another the collecting tubules were filled with pus. On the other hand, Dyke and Maybury[14] found that injections into the bladder of an emulsion of *Staphylococcus aureus* or carmine granules failed to ascend the ureter, that ureteral injection reached the kidney pelvis, but that injection of the kidney pelvis did not ascend the renal tubules. Magoun[15] reported that organisms introduced under pressure into the ureter could be found in the cortex of the kidney and in the blood stream. This agrees with the experiments of Mr. Frank Kidd on excised and post-mortem human kidneys; that argyrol introduced under pressure into the pelvis may reach the cortex. Thiele and Embleton[6] found that the application of *Bacillus mycoides* to the anterior urethra of guinea-pigs caused a rapid spread along uninjured lymphatics to the capsule of the kidney, to the retroperitoneal lymph glands, and via the thoracic duct to the blood stream. A similar though less rapid spread occurred when an

emulsion of the same organism was applied to the glans penis. These experiments are held to explain catheter fever. Infection of the genital tract, however, was a matter of great difficulty both in the male and in the female.

Though these experiments demonstrate certain possible sources of infection of the kidney they cannot be directly applied to man, as we shall see later in examining post-mortem results. These experiments, moreover, were concerned with organisms (*B. mycoides*, *B. pyocyaneus*, and *Sarcina lutea*) which are non-pathogenic to the guinea-pig and therefore do not give rise to any inflammatory or self-limiting process of disease. They correspond to the extremely rapid spread from the urethra to the blood stream in virulent cases of gonorrhœa if the resistance to infection is much lowered.

Schmidt and Aschoff published their important monograph [13] in 1893. In a series of rabbits they injected coliform and other organisms into one ureter after ligature; they found without exception scattered purulent foci in both cortex and medulla, well marked at the end of seven days. Both from the general situation of the lesions in relation to the infected pelvis and from the histological appearances they were in no doubt that the lesions were of the ascending type. They made a distinction between ascending and descending infections in the purulent infiltration of the renal tubules and the absence in ascending pyelonephritis of interstitial tissue changes. It is to be doubted whether any merely histological appearances in the tubules can reveal the path of infection, for they may be due to infection creeping up the tubules or, if the infection has been present some days, to the drainage of infecting material downwards from a cortical or blood infection. Lévy-Solal and Misrachi [17] injected *B. coli* into the ureters of rabbits and found that the heart blood was infected soon after, so that a local lesion of the kidney after an ascending infection may be the result of a secondary blood infection. This may explain Schmidt and Aschoff's results. Sweet and Stewart [18] confirm the results of Thiele and Embleton that the spread of an ascending infection is along the ureteral lymphatics. Contrasting with the tissue change along the lymphatics there was none in the ureteral mucous membrane. Previous experiments carried out by Stewart on dogs in 1910 proved that an ascending infection of the kidney occurred by the passage of organisms through the lymphatics or blood-vessels of the ureter.

POST-MORTEM EVIDENCE OF NATURE AND ORIGIN OF INFECTION IN PURULENT AND SEMI-PURULENT RENAL INFECTIONS.

Animal experimentation therefore shows that, while both descending and ascending infections of the kidney can be produced, the incidence under different experimenters and with different strains of organisms varies considerably and that we should therefore be in error in applying these results too closely to man. It is commonly held that ascending infections in man are frequent; yet there must be solid reason for the opinion of a clinician like Mr. Frank Kidd, who states that they are rare. To attempt to throw some light on the problem I have analysed the post-mortems done at the Radcliffe Infirmary by me or under my supervision during the last 20 years. Included in the series are 165 post-mortems done by me at the 3rd Southern General Hospital during the war, and also a small number done in private. The total number is over 1800. Amongst these are 109 cases of purulent or semi-purulent infections of the kidney. They exclude all cases of general acute or subacute nephritis in the ordinary meaning of the term, all cases of chronic interstitial nephritis whether of the small red or small white type, all cases of tuberculosis, all cases mainly due to calculus formation, and all cases of arterio-sclerosis proper.

I have included for purposes of comparison five cases of hydronephrosis without evidence of infection in which there was obstruction to urinary outflow. The records have been re-examined to determine whether the infection has been of the descending or the ascending type. No attempt has been made to distinguish between an infection travelling upwards by the urine, the mucous membrane, the lymphatics, or the blood. The clinical notes have also been studied, and I take this opportunity of rendering to my colleagues on the staff of the infirmary my grateful thanks for their permission to make use of the records of their cases.

The guiding points in deciding whether an infection of the kidney is to be included in the descending or ascending group have been as follows: (1) a purulent infection of the kidney substance, of whatever anatomical appearance, if it is associated with gross sepsis elsewhere—e.g., uterine—has been looked upon as of descending origin; (2) the infarct type of purulent infiltration of the kidney substance has been taken to indicate a descending infection; the kidney shows a triangular area infiltrated with pus or inflammatory cells with the base of the triangle towards the exterior of the cortex, or some lesion of the kidney parenchyma, purulent or semi-purulent, which may be derived from it; (3) if there is a purulent lesion of the kidney substance, even though not of the infarct type, while the pelvis of the kidney is unaffected, the infection has been taken to be descending; (4) a pyelitis with a more advanced infection of the kidney has been considered to be a descending infection; (5) a pyelitis with a chronic inflammatory lesion in the lower urinary tract has been looked upon as an ascending infection. By this method of division it is just possible that an ascending infection of which the pelvic inflammation had healed while the kidney had not would be placed in the descending group and conversely that a descending infection from which the kidney but not the pelvis had recovered would be considered as an ascending infection. The error from such cases would, however, be extremely small, for clinical considerations would act as a corrective. The evidence of disease in other organs, the previous history, and the clinical features of the patient have been compared with the anatomical lesions in the urinary organs in order to avoid too limited a view of the nature and time limits of the processes at work. The results appear to be clear-cut and the opportunity for bias reduced to very small dimensions

The total of 114 cases have been divided primarily into (1) those with no obstruction to the outflow of urine, 72 cases; (2) those with obstruction, 42 cases

(1) *No Obstruction to the Outflow of Urine.*

				Per cent
Total number of cases			72	100
Ascending infections			4	5·5
Descending or blood infections			57	79·1
Atrophic pyelonephritis			11	15·4
Pyelitis	Ascending infections	4	10	13·7
	Blood	3		
	Atrophic pyelonephritis	3		

(2) *Obstruction to the Outflow of Urine.*

				Per cent
Total number of cases			42	100
Hydronephrosis alone			5	11·9
Infection of kidney substance			37	88·9
Ascending infections			20	47·6
Descending or blood infections			17	40·4
Pyelitis	Ascending	20	22	52·3
	Descending	2		

It is remarkable that only four cases (5·5 per cent.) show an ascending infection in the absence of obstruction. These four cases were, first, a purulent epididymitis in a man of 50; secondly, ectopia vesicæ in a child of 13 days; thirdly, gonococcal salpingitis in a woman of 39; and, fourthly, a wound of the bladder which had been continuously open for 22 years in a man of 37. All were cases in which gross sepsis was present in the lower urinary tract.

The following is the list of clinical diagnosis in 37 cases of descending infection in which the source

of the infection is apparent, whether the spread of the disease be pyæmic, septicæmic, or metastatic.

	Cases.		Cases.
Appendicitis	6	Wounds, including gun-shot wounds	2
Puerperal fever	5	Strangulated hernia	2
Osteomyelitis	4	Pneumonia	1
Cellulitis	3	Duodenal ulcer	1
Abscesses	3	Gastric ulcer	1
Cholelithiasis	2	Bronchiectasis	1
Enteric fevers	2	Ulcerative endocarditis	1
Septic thrombosis	2	Septicæmia	1

In another group of six cases one or more patches of pyelonephritis, mainly of the infarct type, were found as accidental lesions with no clear relation to the disease from which the patient died. These included two cases of fracture of the base of the skull, and one each of pulmonary tuberculosis, diabetes, encephalitis lethargica, and pernicious anæmia. Another 19 cases had gross renal disease; they include 11 cases of atrophic pyelonephritis. Of these, 13 died with symptoms of chronic uræmia.

The total number of cases in which some form of obstruction occurred is 42; amongst these are the five cases of pure hydronephrosis without evidence of sepsis of the kidney or elsewhere. The causes of obstruction include enlarged prostate, calculus, tumours, and spinal cord lesions. Of the cases of obstruction to the flow of urine, therefore, 11·9 per cent. alone escape some form of renal infection. If it be true that in health organisms pass through the kidney substance without producing damage, it is permissible to suppose that in the 45·2 per cent. of descending infections a longer contact of organisms otherwise innocuous might produce damage, whether from their inherent power to injure or from an increase in their virulence by contact with tissues.

The conclusions from this analysis of post-mortem material is that purulent infection of the kidney substance is a lesion that occurs in 5·8 per cent. of general post mortems. Amongst cases that have some form of obstruction to the urinary outflow it occurs in 88·9 per cent., though amongst the cases without obstruction only 6 per cent. showed evidence of ascending infection, and in two of these there was a fistula of the bladder, in one case for 22 years. By far the most common infection of the kidney substance in man is an infection through the blood stream which occurs in 77 per cent. of all cases, whether obstructive or not.

Mr. Frank Kidd, who holds that ascending infection is rare, observes that infections of the urinary organs in either sex, other than gonorrhœa, show no tendency to spread to the opposite sex during marital relations. In two of my post-mortem cases there was gross sepsis of the bladder which had not spread to the kidneys. Sir John Thomson-Walker,[14] however, analysed 100 cases of *B. coli* infection of the urine and found 42 with bladder infection, the kidneys being sterile. In the rest of the 58 cases the urine from one or both kidneys was infected. This suggests that the bladder is a common initial site for a coliform infection, and that ascending infection is more usual. In these cases, however, the infection may have been descending, the renal pelvis having healed and the bladder only remaining infected. Further information is required before they can be fully explained.

THE LESION OF PYELONEPHRITIS.

Gross blood infection of the kidney substance, such as occurs from an acute staphylococcal pyæmia, shows scattered abscesses throughout the kidney substance. In the common form of the very acute type of "surgical kidney" the organ is swollen, soft, hyperæmic, and generally infiltrated with inflammatory cells, but without abscess formation; this form may develop into gangrene. The commoner forms of kidney infection are, however, local, affect a segment of kidney substance, and may be generally described as of the infarct type. A wedge of kidney substance with base towards the surface is necrotic and breaks down into an irregular abscess cavity which discharges into the kidney pelvis, where it produces a perirenal abscess or is absorbed. In other kidneys, where presumably the embolic infection has been less compact, the area shows up in the surface as a group of small abscesses which also appear in section in that segment of the kidney corresponding to the abscesses on the surface. There may be several patches of such purulent infiltration, the intervening portions of the kidney substance being healthy. One kidney only may be affected, as in two cases of enlarged prostate in the obstructive group of my series.

In one case, a man of 56, there was hydronephrosis on one side and general abscesses, mainly cortical, on the other. In the other, a man of 70, who died 12 days after an accident which caused a fracture of the base of the skull, there was on the left side atrophic hydronephrosis and pyelonephritis, on the right side there was acute hydronephrosis.

Evolution of the Lesion.

The localised infarct type of pyelonephritis is capable of healing like purulent lesions in other parts; the scar comprises a segment of the kidney substance depressed on the surface, sometimes with a local dilatation of the pelvis. Some elements of kidney structure may still be recognisable in the scar tissue. Occasionally one sees loculated cysts occupying a segment of kidney substance, in shape very suggestive of an origin from a septic infarcted area, but I have not yet been able in any one case to attribute these lesions to pyelonephritis. A perirenal abscess is frequently due to a cortical abscess spreading to the perirenal tissues.

Apart from the ascent of an infection from below, pyelitis, as the sole complication of pyelonephritis, is rare and never amounts to a severe lesion. If, however, calculus formation occurs, then pyelitis is present either locally or generally, according to the amount of irritated surface. Or if, either from the dislodgment of calculi or obstruction of the ureter by septic discharges, the inflammatory matter is confined, then a pyonephrosis results. Five out of 62 of my post-mortem cases with descending infections had calculi as a secondary feature. Five others had pyonephrosis. One case showed ureteritis and cystitis and another showed prostatitis. Another interesting lesion is dilatation of the ureter, which was noted in 6 out of the 62 cases of descending infections; in three of these there was demonstrable obstruction. The explanation of these cases without obstruction is not obvious.

At the last meeting of the Association of Physicians Dr. A. F. Hurst showed a radiogram of an idiopathic dilatation of the left ureter which, he suggested, might be due to achalasia following changes in the nerve-cells similar to certain proved cases of achalasia of the œsophagus. The anatomical investigation of these cases has yet to be undertaken.

It is clear that the lesion of pyelonephritis is not of grave importance if localised. It has been twice seen post mortem as a purely accidental lesion, which cannot have seriously affected the health or have caused death, for instance, in post mortems for fractured base following an accident. If these were accidental lesions, there ought to be evidence of healing, and some of my post-mortems have, in fact, shown scars which, because of the appearance of the scar itself or the presence of a small recent patch of pyelonephritis, I took as evidence of this nature. Four cases showed abscesses closely neighboured by cysts, and in the fixed specimens of two of these the centre of the cysts contained clear colloid material and a peripheral purulent zone beneath the capsule. I am convinced that some of the cysts met with post mortem that are roughly classified as "congenital" have been caused by the healing of a localised pyelonephritis. The small recent patch of pyelonephritis produces no change in the size of the kidney. The patch itself may show on the surface as a slightly

swollen area, but does not affect the kidney as a whole. When the patch is large, or if the whole kidney is affected by abscess formation or general acute inflammation with or without distension of the pelvis, the kidney is enlarged. In some cases the lesion had been successive and different stages could easily be distinguished.

This was so in the case of a woman of 30 who died of uræmia. The left kidney was only 3 inches long, and showed recent pyelonephritis with local scarring elsewhere, probably from similar lesions. The right was 4 inches in length and had a medium-sized cyst at the lower pole and numerous abscesses and cysts elsewhere.

The proof that these kidneys had been subject to chronic repeated pyelonephritis lies in the segmental nature of the lesion, one portion being involved in a general abscess formation or acute inflammation, another in general fibrosis, while others preserve the normal relations of cortex and medulla without the slightest chronic fibrotic change. But kidneys which are subject to chronic interstitial nephritis are equally liable with the normal to be attacked by pyelonephritis.

Thus a woman of 27 who had suffered from chronic interstitial nephritis of the Rose-Bradford type (headache and vomiting for 12 months and eye changes for two and a half months) died from uræmia. Both kidneys showed typical chronic interstitial nephritis with secondary pyelonephritis of the infarct type.

That type of kidney inflammation which is caused by repeated attacks of pyelonephritis and scarring, and which is called atrophic pyelonephritis, is not so clearly recognised amongst physicians as amongst urologists. In my series of post-mortems there are 11 cases. It may occur on one or both sides; the kidney is small, contracted, and fibrosed, and in extreme cases there may be no kidney substance left. It is sometimes extremely difficult to distinguish from the kidney of chronic interstitial nephritis. The distinction is as follows:—

1. The atrophy in atrophic pyelonephritis is segmental, from healing and fibrosis of successively infarcted and inflamed areas, whereas in chronic interstitial nephritis fibrosis is general.

2. The surface of the kidney in atrophic pyelonephritis is affected unevenly in patches; some areas are depressed, smooth, and fibrous, or alternating with others but slightly affected, whereas in chronic interstitial nephritis the kidney is generally granular, whether fine or coarse.

3. A section of a kidney in atrophic pyelonephritis may show portions of kidney substance that bear the normal relations of cortex and medulla. All parts of the kidney substance are equally affected in chronic interstitial nephritis.

4. In the kidney of atrophic pyelonephritis the fibrosis is patchy; in the chronic interstitial variety it is generalised.

5. In the atrophy of pyelonephritis the kidney pelvis may show general dilatation or one or more calyces may be affected. In chronic interstitial nephritis the pelvis is unaffected and is not dilated. In the former there is sometimes a stone, in the latter rarely.

6. Both types give rise to urine which contains a small amount of albumin.

7. In chronic pyelonephritis atrophy may affect one kidney alone or one more than the other. In chronic interstitial nephritis "both kidneys are usually affected in equal degree." This fact is not against a blood infection, because infarcts, whether aseptic or septic, are sometimes found in one kidney only.

Surgical Evidence Bearing on Pyelonephritis.

I have said that pyelonephritis in its more localised form is a slight ailment and may be entirely incidental as compared with the main disease from which the patient is suffering; but some authorities assert that, in children at least, pyelonephritis is invariably fatal, because we see the lesion in cases that die, while the less severe pyelitis recovers. The subject may be studied from cases in which the kidneys have been actually exposed during the illness of the patient, when the symptoms can be clearly connected with the anatomical appearances. Not all cases operated upon have been severe, for the question of operation in particular conditions depends to some extent at least whether the patient comes under a physician or a surgeon. Though the recovery-rate in the following cases is high, it cannot be doubted that some of the patients would have got well, though perhaps more slowly, if treated by medicinal measures alone. The following list of cases is designed to illustrate the types of case suffering from purulent affections of the kidney. The examples are classified in descending order of severity.

(1) *Gangrene, Coliform Pyuria, Descending Infection.*

CASE 1.—Female aged 14.[20] Intense pain on right side, persistent vomiting, no urinary symptoms, no bowel action for five days. Abdomen tender and right loin rigid. A catheter specimen of urine was clear, but the deposit contained pus cells, hyaline and granular casts, and a coliform bacillus in large numbers. The kidney was enlarged to about the twice its ordinary size. The changes were cortical rather than pelvic. Most of the cortex was gangrenous, the veins being engorged with clotted blood. At the upper and lower poles could be seen streaks of pus in the tubules, and multiple pin-point abscesses. At one or two places small areas of living cortex could still be seen, but even in these there was cloudy swelling. The mucous membrane of the pelvis was moderately engorged with blood, and the submucous layer swollen with inflammatory products. The kidney was removed, the urine became sterile in ten days, and the patient recovered.

(2) *Acute, Generalised Inflammation without Abscess Formation. Descending Infection.*

CASE 2.—Female aged 33.[21] High temperature, rapid pulse; strangury, enlarged, tender right kidney. *B. coli* and pus in urine. There was extensive œdema of the perinephric fatty tissue and some excess of blood in this tissue. The right kidney was enlarged to more than twice its natural size. The fibrous capsule was stretched and tense. The whole organ was very hot, steaming, and so engorged with dusky blood that it bled on the slightest touch. On section the cortex bulged above the line of section and dripped blood, so that little detail could be observed. There were no multiple pin-point abscesses to be seen in the cortex. The opened pelvis contained an excess of foul urine under tension, presumably because the ureter was partially blocked by inflammatory swelling. This kidney returned to normal size in less than a fortnight, and from observations made on the urine it seemed clear that the inflammatory products had been entirely absorbed.

(3) *Generalised Abscess Formation.*

CASE 3.—Female, aged 23, married.[21] Sharp pain in left side of abdomen, so severe that she fainted. Chills and vomiting. Descending infection. The urine contained no pus, blood, or albumin. There was a leucocytosis of 26,000. Neither kidney could be palpated. At the operation, 26 hours after the first symptom, the left kidney was found to be enlarged and the perirenal tissue œdematous. It was covered with characteristic small dark and yellow spots, multiple septic infarcts which contained *B. coli*. The kidney was removed. The right kidney was normal in size and position. The patient made a prompt recovery.

(4) *Multiple Septic Infarcts.*

CASE 4.—Male, aged 27,[22] complaining of pain in the loin. The urine was acid in reaction, specific gravity 1018, and contained one-eighth of albumin when boiled and allowed to settle. Under the microscope the deposit contained abundant polymorphonuclear leucocytes. There were very few red corpuscles and no casts. At the operation the kidney was found to be about twice its normal size and intensely congested. Its surface was covered with a great number of subcapsular hæmorrhagic spots, the larger ones having yellow suppurating centres. The kidney was removed. On being divided vertically from cortex to pelvis it showed that the spots on the surface were the bases of wedge-shaped hæmorrhagic areas running into the pyramids. Submucous hæmorrhages were found at several points in the pelvis of the kidney. Sections were cut, but no micro-organisms could be demonstrated. The areas of inflammation were in the bundles of tubules forming the lobules, and not around the vessels between them. The patient recovered.

(5) *Local Infarction.*

CASE 5.—Female aged 32.[23] Pain in right kidney region. The urine was cloudy and contained 0·25 per cent. of albumin: in the deposit was pus and blood. There were no casts. At the operation the kidney was one-third larger than normal and much congested. In the middle quarter was an area about 1½ inches in length, of irregular surface.

and slightly harder than normal. The kidney was split along the convex border, and the area observed on the surface was found to involve the central quarter of the kidney down to the renal pelvis. This area contained several small foci of purulent material. The remainder of the kidneys showed congestion. A wedge-shaped piece, including the centre third of the kidney and about ½ inch outside the infected area, was resected. The patient left the hospital 15 days after the operation with a small, clean, granulating wound.

CASE 6.—An active, healthy, multiparous woman of 40 had an acute pain in her left side with fever and sweating. When seen on the third day of her illness she looked ill and septic. The tongue was coated, the pulse was relatively high, but the heart and lungs were normal. There was no sign of typhoid fever. The abdomen moved well and was not rigid; on deep palpation there was a localised area of tenderness in the left hypochondrium which could also be elicited by pressure on the last rib and below. The urine contained a small amount of albumin, a small number of pus cells, and a good growth of *B. coli*. Under treatment by hot fomentations to the loin and an abundant intake of alkaline fluids the attack settled down, the patient became afebrile, and the urine contained only a trace of albumin, and pus cells on centrifugalisation. It was judged at the time that the left kidney, which continued to secrete purulent urine, was badly and permanently damaged and would remain a source of danger. This kidney was subsequently excised. To external observation it was normal, but on section a whitish patch and lines located chiefly to the boundary zone and pyramids were found in one part. These were inflammatory changes in process of healing; they might have healed if the kidney had been left. In this patient the excision of the left kidney did not prevent the right ultimately becoming infected, for she suffered from repeated attacks of pain in the right loin, frequency, and pyuria. Since there was no evidence of disease in the bladder or urethra, the infection must have been transferred by the blood.

THE CLINICAL ASPECT OF PYELONEPHRITIS.

In order to understand the symptoms of pyelonephritis we must realise that the lesion may vary from a small infarction to an affection of the whole kidney, and that one or both kidneys may be involved. In 20 cases of surgically verified pyelonephritis symptoms and physical signs must have been present or operation would not have been undertaken; therefore they could not have been the mildest cases. So far as the details are recorded, pain in some form was present in 18 out of 20 cases, usually in the affected loin and once in the axilla. Rigidity of the abdominal muscles on the affected side is described once, and a tender kidney, without rigidity, four times. Vomiting occurred in 3 cases, frequency of micturition in 3, strangury in 1, and retention in 1. Definite pyuria occurred in 12 cases and chills or rigors in 3. Fever is only mentioned in 6 cases and a polymorphonuclear leucocytosis in 5. On post-mortem evidence it appears that the mildest form, the patchy type, may be present without the symptoms being such as to cause the patient to seek medical aid; thus in my post-mortem series there were two cases of fractured base in one case after a street accident and in another after a fall from a window. Two cases show evidence of pyelonephritis in which healing has been complete.

One, a male of 22, admitted for perforation of a duodenal ulcer, had a cicatrised patch in the right kidney, which was much smaller than normal. The left was hypertrophied; there were scars and a sinus leading to the left hip region and a shortening of the left femur, probably from old osteomyelitis. The condition of the leg and right kidney was almost certainly connected as cause and effect, which is confirmed by the fact that out of the total of 51 cases of descending infections there were four clear cases of pyelonephritis associated with acute osteomyelitis.

The other case, a male aged 40, who died of encephalitis lethargica, showed a renal scar with cysts and whitish points reducing the cortex to a small amount locally. This man had been wounded in the war. The urine contained no albumin, and was normal to naked-eye examination.

This case corresponds to another of gunshot wound with abscess in both kidneys. These two cases show the lesion nature of a localised non-recurrent pyelonephritis.

In the majority of cases without obstruction and without gross sepsis in the lower urinary tract the lesion was discovered post mortem and clinically was overshadowed by the main infective disease. Thus there are 5 cases of appendicitis, 5 of puerperal fever, 4 of osteomyelitis, 4 of cellulitis, and 2 of cholelithiasis. The diagnosis in the remainder were: septic thrombosis, cavernous sinus thrombosis, ulcerative endocarditis, anterior staphyloma, septicæmia, lumbar abscess, bronchiectasis and pneumococcal meningitis, broncho-pneumonia (three cases). In one case of typhoid the lesion was found post mortem; in another of paratyphoid B the kidney condition caused marked pyuria associated with a coliform organism. Diabetes accounted for two cases.

The acute attack of moderate severity is a febrile disturbance liable if prolonged to be mistaken for typhoid; there may be no local symptoms to draw attention to the site of the disease, especially if the urine be not examined carefully. Frequency of micturition may be entirely absent and its presence may depend upon the presence of pyelitis. The kidney affected may be, but is not necessarily, enlarged and tender. Pressure in the loin below the last rib may be painful. In doubtful cases pain may be elicited by hammer percussion over the suspected kidney.[24] Sweating, rigors, pain, and strangury are present in more violent attacks. If the lesion does not heal completely there may follow perirenal abscess, nephrolithiasis, bacilluria, pyelitis, pyonephrosis, and—if attacks have been repeated and destruction of the kidney marked—uræmia and its concomitant symptoms.

A classification of the various grades of attack would include (1) mild attacks which may pass without notice or perhaps slight discomfort; (2) moderate attacks which pass for what is ordinarily termed acute pyelitis; (3) septicæmic attacks, simulating typhoid or other grave conditions; (4) fulminating attacks in which the kidney may become gangrenous and death imminent. The last stage of a pyelonephritis in which there has been increasing destruction of the kidney substance is chronic uræmia, of the type showing gradual failure of bodily processes, usually without convulsions. Apart from atrophic pyelonephritis there were four such cases in my series of 51 descending infections. Nine out of 11 of the atrophic cases died of uræmia. In the obstructive cases, which were mostly surgical, the renal condition was frequently overshadowed and therefore not sufficiently investigated, but uræmia terminates many of these cases.

Clinical Aspect of Atrophic Pyelonephritis.

It is not possible to give a complete account of the symptoms, for the subject requires further study. Urinary symptoms need not be present or marked; all patients would appear to have neurasthenia or chronic ill-health and the terminal stage is chronic uræmia. Of the 11 cases in my series one, a female of 37, had had frequency and a tendency to enuresis all her life. Another, a male aged 57, had been delicate in infancy and had suffered from fits; there had been two fits in adult life, and at the age of 27 he had suffered from gravel. Another, a male aged 50, suffered from renal calculi in both kidneys and had had three operations. Two showed bone changes: one admitted for genu valgum had had fainting attacks and epistaxis. Another, an infant of 3, was mistaken for rickets at first, and for purpura on his second admission, during which he died. It is interesting to note that in this case the mother had suffered from the pyelitis of pregnancy. A girl of 11, ultimately found to be uræmic, was admitted with meningeal symptoms. A female of 25 had been epileptic for several years.

In some cases the blood pressure, both maximum and minimum, is normal. This is not to be explained by the fall in blood pressure that precedes the fatal issue in uræmia, because the hypertrophy of the heart, so constant a feature of true chronic interstitial nephritis, is frequently absent. Out of ten cases of atrophic pyelonephritis the heart was hypertrophied in four and normal in six. In one case, a female of 38, the heart was definitely less in weight than the normal (213 g. as compared with the normal

of 225–280 g.). Dr. Geoffrey Evans, in his paper on arterio-sclerosis in relation to renal disease,[25] refers to four cases of chronic renal disease without hypertrophy of the heart. The state of the cardiovascular system is independent of the blood-urea, for in the three cases in which this is recorded it was high, from 90 to 291 mg. per 100 c.cm. of blood. Two had cardiac hypertrophy. If there be any acute or subacute pyelonephritis the urine contains pus cells, a trace of albumin, and organisms; if the lesion be healed and fibrotic it may contain a trace of albumin only. The specific gravity is low. The ocular fundi were noted in 4 out of 11 cases; in 3 of these there was no change; in the fourth there were changes typical of chronic interstitial nephritis—namely, flame-shaped hæmorrhages, retinal changes, and œdema of the discs.

I had under my care in the first part of this year a boy, aged 3 years, who had been treated by my colleague, Mr. G. R. Girdlestone, for genu valgum. He was put under me by Dr. F. G. Proudfoot, who found him suffering from fever and frequency of micturition, with pus and blood in the urine. On admission he was a feeble, delicate-looking child. There was no evidence of rickets; the weight was 4 lb. below the normal for his age. There was no frequency and he was passing 1 pint of urine per diem, containing a trace of albumin and abundant *B coli*, which gave the freshly passed urine a fishy smell. The blood pressure was 94/55, and the blood-urea was 23 mg. per 100 c.cm. of blood. The ocular fundi were normal. The urea-concentration test produced extreme drowsiness for several hours and there was clear deficiency in urea excretion in the first hour. The urine was constantly bacilluric on alkalies, but it could be rendered clear for a few days if he were given an acid mixture with hexamine. It is reasonable to suppose that this child has suffered from chronic *B. coli* pyelonephritis for the greater part of his life. His mother, who was delivered in the maternity department of the Radcliffe Infirmary, had swollen hands and face for the last months of pregnancy and had albumin in the urine. Instruments were employed during labour, but the puerperium was normal.

Pyelonephritis in Children.

My series of post-mortems does not provide the necessary experience for independent conclusions. The recent study of Bruce Chown[26] indicates that in one group of children under 2 years it is an acute fatal disease secondary to gastro-intestinal, middle-ear, skin, or chest infections, that the symptoms are those of an acute infection with meningeal, gastro-intestinal, or respiratory disorder, and that there is pus and albumin in the urine. The kidney in these cases shows diffuse or focal suppurative nephritis, though actual abscess formation may not occur. The pelvis of the kidney shows no inflammation, and the organism mainly responsible is *B. coli*.

In a second group of four cases no clear reason for the pyuria could be discovered in the kidney post mortem.

In a third group there was chronic pyuria and some evidence of healing in the kidney.

One of Chown's cases in his first group was unsuspected during life, the child having died as the result of an operation for hydrocephalus; it therefore corresponds to my cases of accidental or unsuspected infection. Chown quotes three cases, two from literature and one which he had observed in the service of Dr. Emmett Holt, in which the lesion had been observed during life in operations upon the affected kidney. Chown concludes that the so-called pyelitis of infancy, in the absence of infection of the lower urinary tract, is a misnomer, and that the lesion of this disorder is renal. He does not include any example of atrophic pyelonephritis, but in view of the age of his patients this would not be likely. The youngest case of atrophic pyelonephritis in my series was three years old. Chown's cases were all under two.

Several authors[27] have called attention to the fact that pyelitis in children is a sequence to the pyelitis of pregnancy in the mother.

PYELITIS.

We are accustomed to speak of pyelitis, meaning an inflammation of the inner lining of the pelvis of the kidney, as a common lesion; it occurred in 32 cases (28·8 per cent.) in my post-mortem series. It has been assumed that an ascending infection cannot be present without it, but amongst the descending infections it is rare, five cases out of a total of 71, or 7 per cent. It was present in 22, or 52 per cent., of the 42 cases with obstruction in some part of the urinary tract. This agrees with the opinion of Helmholz[28] that clinically obstruction is a common cause of failure in the treatment of pyelitis in children. It was present in three, or 27 per cent., of the 11 cases of atrophic pyelonephritis assumed to be blood infections. Allowing for error due to the small number of cases, it is interesting to note in this type the higher percentage, corresponding to the longer duration of the infection, as compared with the percentage of seven in the recent blood infections.

Summarising, therefore, the occurrence of pyelitis itself in these purulent and semi-purulent infections of the kidney, it may be said that it is very uncommon in infections of the urinary tract in the absence of obstruction, and that when obstruction is present it is seen in roughly half the cases. For purposes of clinical diagnosis, therefore, if obstruction can be excluded it may be ruled out, for it seldom occurs in them apart from infection of the kidney substance, and, if present, it is slight and of secondary importance. If, in the absence of obstruction or gross sepsis of the bladder, the anatomical lesion of pyelitis is so rare as judged by post-mortem results, what is the lesion present in the large number of cases of so-called "pyelitis" that we meet in men, women, and children? I believe, on the evidence I have given, that they are with few exceptions cases of pyelonephritis. It cannot be doubted that most of the cases described would pass as cases of pyelitis in the ordinary course of practice.

But pyelitis as an anatomical lesion occurs under other conditions which have been deliberately excluded in this analysis. It occurs in tuberculosis of the kidney; the initial renal infection is commonly at the tip of one pyramid, and as it progresses there is an invasion of the whole renal pelvis until if there be obstruction in the ureter a tuberculous pyonephrosis is the ultimate result. Secondly, pyelitis occurs when there is a stone in the renal pelvis; irritation is set up and inflammation of the whole or part of the cavity follows, with or without obstruction. Another infection in which a pyelitis may be expected is gonorrhœa when extension of the disease occurs upwards. One of my post-mortems with an ascending infection had gonococcal salpingitis. The fulminating cases of gonorrhœa, with ascent of the infection, show the features of a surgical kidney; others have been recorded with renal abscesses. The chronic renal infections following gonorrhœa occur as a chronic pyelitis on one or both sides. The number of cases of gonorrhœal infection of the kidney reported in medical literature is very small. Prof. Turnbull has given a careful description of such a kidney in one of Mr. Frank Kidd's cases.[29] The renal pelvis was chronically inflamed and showed scattered cysts. The kidney had had to be removed for recurrent renal hæmorrhage.

THE URINE IN PYELONEPHRITIS AND PYELITIS.

Pus, in gross or microscopic amounts, may be present in the urine in inflammation of the urethra, prostate, bladder, kidney pelvis, and kidney substance. It may be discharged with cells that can be recognised as coming from the transitional epithelium which lines the kidney pelvis, ureter, and bladder, or with squamous epithelium from the urethra. Inflammation of the kidney substance may give rise to the presence of pus casts formed in the renal tubules. In the majority of cases of inflammation of the urinary tract no clear guide to the site of the inflammation can be obtained by any of the finer microscopic tests, and the examination of the urine should play an important but not a primary part in the scheme of examination. The main indication of the site of the lesion must be from clinical or special urological examination.

The state of the urine varies considerably in pyelitis and pyelonephritis. Frequently it may give very little help in diagnosis, and in some instances the absence of any abnormality may even divert attention from the kidney. In the first place a localised purulent infection of the kidney substance may be present without the slightest trace of abnormality in the urine; this is especially true in acute infarctions, which may be localised to the cortex.

An active school-boy, aged 10, whom I saw with Dr. John Wood, had had pain in the left iliac fossa six days previously, followed by fever. The pulse-rate was 110, temperature 101·8° F., respirations 18; there were no physical signs and the Widal reaction was negative. The urine, which had been negative to ordinary examination a few days before, was clear, contained no albumin, and on centrifugalisation showed a few pus cells and catarrhal cells of indefinite origin. Seven days later there was flexion of the left thigh and a painful swelling in the left loin, which proved to be a perirenal abscess from *Staphylococcus aureus*. This was opened and the boy made a good recovery.

In some cases of pyelonephritis there may be no albumin and so small a discharge of pus that it can only be recognised by microscopical examination of the centrifugalised deposit. In other cases of pyelonephritis the urine may show a trace of albumin which may be missed in a cursory examination of a turbid urine. In most cases of pyelonephritis from *B. coli* the naked-eye features of the urine are characteristic. The urine is cloudy, fails to clear on boiling, and the shimmer of bacilluria can be seen if it is stirred up with a glass rod. The fishy odour of the urine is characteristic of the infection. The presence of pus in the urine does not necessarily mean abscess formation in the kidney even if the kidney be the source of the pus: an inflammatory lesion due to one of the pus-forming organisms is sufficient. Gross septicæmia and pyæmia may be present without pus or inflammatory cells in the urine so long as the kidney substance is not affected. Cloudy swelling gives rise to slight albuminuria only.

The presence of blood in the urine greatly obscures any indications of renal disease of the purulent type. In the pyuria of pyelitis proper, as from a stone in the pelvis of the kidney, there is also pyuria, which is indistinguishable from the pyuria of pyelonephritis except that in the former tailed cells from the pelvic mucous membrane may be present.

The reason for bacilluria and the nature of the lesion or lesions if any is not clear. It occurs in typhoid fever without any indication of disease of the kidney post mortem. In one of Patrick's[29] cases, however, there were small abscesses in the left kidney. Bacilluria may exist for years in patients who may suffer from time to time from pyelonephritis and who may pass a small amount of pus either constantly or occasionally. A patient whom I watched for many years had a constant slight evening temperature of 99° or thereabouts, with constant bacilluria due to *B. coli*. During my care of her she had two attacks of so-called pyelitis. The bacilluria was not affected by any medicinal therapy, but a temporary disappearance followed a course of vaccine therapy.

Conclusions.

1. The lesion of pyelonephritis, either local or general, on one or both sides, is not a rare clinical condition.

2. It varies in its severity from an ailment that may pass unnoticed to one which is dangerous or lethal.

3. Recovery from the more local lesions is usual.

4. A tendency to recurrence leads ultimately to complete impairment of kidney function and a type of uræmia which may be different from that of chronic interstitial nephritis.

5. Pyelitis is secondary and rare in the descending or blood infections, but common when there is any form of obstruction in the urinary tract.

6. Pyelitis as a localised lesion without pyelonephritis is caused by ascending infections, tuberculosis, nephrolithiasis, and gonorrhœa.

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SYMPTOMS DUE TO MESENTERIC LYMPHADENITIS.*

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MESENTERIC lymphadenitis is common—the physician, surgeon, and general practitioner are equally likely to see cases—and its manifestations are so numerous and it mimics so many other conditions that our knowledge is constantly advancing and, it is to be hoped, will still advance. I am by no means certain that the conclusions arrived at so far will all be verified by the future. We are greatly indebted to the researches of J. K. Jamieson and J. F. Dobson on the anatomy of the lymph glands draining the intestines.

The glands of the small gut are said to number about 200, and they lie in three sets between the layers of the mesentery: (1) the primary set, lying close to the margin of the bowel; (2) a secondary set, more numerous, arranged along the loops of the arterial arcades and the rami intestinales; (3) a third set, more numerous still, accompany the main trunk of the superior mesenteric artery. The glands draining the ileocæcal angle are as follows: (1) ileal, in the mesentery of the terminal ileum; (2) anterior ileocolic, (3) posterior ileocolic, in the angle between the ileum and cæcum; (4) appendicular, one gland, not constand, in the meso-appendix. The glands draining the large intestine are described in four groups: (1) the epicolic, lying on the bowel wall; (2) the paracolic, along the arterial arcades; (3) the intermediate, lying along the course of the main colic

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vessels; (4) the main group, around these arteries at their origin. Some of the lymph nodes draining the colon lie very close to the ureters, a fact of clinical importance.

Morbid Anatomy.

Inflammation of the lymphatic glands may be simple or tuberculous.

Simple lymphadenitis is a constant feature in infections of the wall of the alimentary canal, such as appendicitis, and is sometimes seen when no cause is apparent. There is no clear evidence whether the gland infection is due to *Bacillus coli* or to cocci or to both. Suppuration presumably occurs, but we seldom see it. The lymph nodes in simple lymphadenitis are enlarged, soft, white or pink on section, and not usually adherent to the layers of the mesentery. It is difficult to say just what degree of enlargement constitutes a pathological state; roughly, the glands that are readily visible at an ordinary operation for appendicectomy ought not to be larger than a good-sized pea.

Tuberculous lymphadenitis in some of its forms is not easy to distinguish by the naked eye, either externally or on section, from simple lymphadenitis. In the later stages it goes through the usual changes: caseation, softening, scar-contraction, or calcification. The gland often becomes adherent to the intestine or to the layers of the mesentery. Not uncommonly it is stony hard, and there may be sharp points protruding through the mesentery.

There is universal agreement that mesenteric lymphadenitis, whether simple or tuberculous or undetermined, is very common, at any rate in children. At autopsies on tuberculous subjects it is almost constant, and in children who for any reason come to laparotomy it can generally be found if sought (Corner). Sometimes very many glands are found uniformly enlarged, and in other cases there are only a few, which may attain a great size, the favourite site being in the angle between the terminal ileum and the cæcum.

Physiology.

The lymph nodes act like a sewage farm, detaining bacteria and other deleterious matter drained to them from the bowel by afferent lymphatic vessels, and like a sewage farm they may become a nuisance if they are overloaded with work, especially if they have to deal with a big dose brought to them very rapidly. More interesting, and of great importance for our present purposes, is their relation to deep afferent nerves. The presence of Pacinian corpuscles in the mesentery provides a clue which is worth following up. We have learned much physiology from operations on conscious patients under local anæsthesia. I have removed the greater part of the stomach, performed gastrostomy, gastro-enterostomy, cæcostomy or enterostomy, with the aid of novocaine injected into the abdominal wall, without any anæsthetic at all for the abdominal viscera. It is simple truth to say that the majority feel no pain at all; indeed, if they have been given a small dose of morphia and scopolamine they usually get a nap during the operation. But to secure success one thing above all others is essential: there must be no pulling or pressure on the mesentery. To introduce the hand through a rather small opening for purposes of exploration is quite enough to upset the patient. We may cut or crush the bowel with impunity, or lift it about gently, but we must be exceedingly respectful to the mesentery. The phenomena of abdominal pain confirm this observation. As Tyrrell Gray has pointed out, a child with intussusception is quite happy between the attacks of colic, although the intestine is distended and swollen, but when peristalsis occurs the mesentery is pulled upon and pain begins. When an ulcer in the stomach or duodenum perforates, the peritoneum is irritated, and there is violent and persistent pain. No doubt Pacinian corpuscles are sensory end-organs in the very sensitive mesentery.

We may therefore believe that an innocent-looking lymph gland in the mesentery, when it suffers inflammation and swells, especially if it becomes adherent to the peritoneal covering and fixes it, may be a source of pain. Waves of peristalsis which normally would give rise to such gentle movements of the mesentery that we should be unconscious of them, may, under these circumstances, become acutely painful, yet the pain may be of short duration.

Symptoms Due to Mesenteric Lymphadenitis.

It is difficult in some cases even at operation to decide whether an enlarged gland is simple or tuberculous. So I shall not attempt to draw a distinction all the way through. It will be necessary to adopt quite a complicated classification to cover the ground. My illustrative cases are drawn almost entirely from my private practice of the last few years, because the notes are much more reliable than those of hospital cases.

1. *General symptoms due to tuberculous mesenterico-lymphadenitis.*—It is well known that tubercle bacilli may lie latent for many years in the bronchial or mesenteric glands, and then leak into the lymphatic or vascular circulation and either cause fatal acute miliary tuberculosis, or settle in some joint or bone, and give rise to tuberculous disease. There is another group of cases in which the diagnosis is more a matter of guesswork than of proof, but in which I strongly suspect that tuberculous mesenterico-lymphadenitis or bronchial lymphadenitis is the hidden cause of the trouble. One sees from time to time children, about 6 to 10 years of age, who tire easily and go off their food, but show no other symptoms whatever. If the temperature is taken regularly, it will be found that there is a rise to 100° or 101° F. every night for weeks or months or even years. Yet the child never seems really ill, and a routine medical examination shows no cause.

It seems to me a reasonable suggestion that the mesenteric glands, which we know are so often found in unhealthy children, may frequently be the cause of the fever. One certainly finds children who get attacks of fever without obvious cause, who eventually develop the clinical picture of mesenteric lymphadenitis which we shall shortly describe.

2. *Violent pain simulating renal colic.*—I have seen several patients whose pain was as severe as I have ever witnessed from any cause (except perhaps acute pancreatitis). Two in particular linger in my memory.

Six years ago I was asked to see a middle-aged man who had had three attacks of very severe pain in the lower abdomen within a year, with a tendency to frequency of micturition during the attack. The pain lasted about half an hour. A physical examination revealed nothing. Next day I was urgently summoned, as he was in agony. I found him walking his bedroom doubled up with violent pain in the left iliac fossa. I diagnosed ureteral colic, and gave morphia. Skiagrams showed shadows apparently typical of ureteral stones, but in the right ureter, whereas his pain had been on the left side. Cystoscopy showed nothing. I opened the abdomen and removed two calcified glands from the mesentery of the ileum, lying close to the ureter. Nothing else could be found, and he had no return of the symptoms.

Last January a medical man brought a nurse of 20 to see me from the country. She had had an attack, diagnosed as right renal colic, in London three weeks before, and had been sent to one of the leading London hospitals where they told her that she had passed a renal stone, but that more were left behind. When I saw her she had been for 21 hours in the most excruciating pain, quite unrelieved by large doses of morphia and atropine. There was no sickness, no hæmaturia, and no bladder irritation. She and the doctor had had a very trying journey on account of her sufferings: she was sitting up and hugging herself, and showing all the signs of great pain. A skiagram, obtained only with difficulty, showed shadows along the line of the left ureter. In view of the severity and recurrence of the pain I did not wait to pass ureteral catheters, but operated forthwith. The kidney and ureter were normal, but there were four stony glands in the mesentery close to the ureter, which were removed. She has had no further pain as far as I know.

[illegible] will have seen patients with pain [illegible] shadows that might be mistaken for stones, which are, as a matter of fact, gallstones or [illegible] gallbladder, but it is not generally recognised that the pain may be so severe. Sir John Thomson-Walker has, however, recorded the condition in [illegible] that out of 28 cases the pain was [illegible] in 4, moderate in 7, and quite severe in 11. It may last from a few minutes to several days, and mimic more than appendicitis.

3. *Mesenteric lymphadenitis simulating appendicitis.*—[illegible] H. Fraser, Braithwaite, Carson, [illegible] have referred during recent years to the close similarity between symptoms of this [illegible] and of appendicitis. In my experience [illegible] mistakes in the diagnosis of acute appendicitis are far more numerous than from any other cause. [illegible] a probable diagnosis of appendicitis, [illegible] proved on exploration to be mesenteric lymphadenitis. It is true that in several of these lymphadenitis was thought to be a [illegible], and in a few lymphadenitis was [illegible] only possible.

[illegible] cases in which it was difficult to distinguish between appendicitis and mesenteric lymphadenitis, [illegible] an infant of 21 months, ill [illegible] with abdominal pain and fever, and discovered, [illegible] tenderness in the right iliac fossa, [illegible] enlarged and inflamed glands, [illegible] adults, all females, giving a history of several attacks of pain in the epigastrium and right [illegible]. The pain might last a few hours or some days. They complained of dyspepsia, and all had [illegible] over the appendix. The temperature [illegible]. In each case removal of the glands, [illegible] in the classical way, stopped the attacks. [illegible] children between 8 and 16, [illegible] had suffered from repeated attacks of [illegible] in the lower abdomen, lasting [illegible] days. In all but one [illegible] fever, from [illegible] to [illegible]. They were [illegible] generally tender [illegible] marked. A [illegible] the inflamed [illegible] of the glands was [illegible] to be [illegible] when removal [illegible] number of [illegible] attacks, but [illegible]

[illegible] appendicitis is simulated, stops the pain and fever and prevents further attacks, which, from the patient's point of view, is quite satisfactory. Naturally one removes the appendix as well.

4. *Vague abdominal pain in children.*—Every practitioner sees quite a number of children who suffer from more or less frequent attacks of mid-abdominal pain, not related to food, with or without a rise of temperature. The pain may only last a few minutes or it may persist for days. A routine examination reveals nothing at all. The appetite may be capricious, and there is sometimes a little diarrhœa. No doubt this rather vague clinical picture covers more than one pathological cause, but knowing what we do about mesenteric lymphadenitis, its widespread occurrence, and the way in which it manifests itself when the glands lie close to the appendix and so get operated on and recognised, it seems all but certain that the majority of these children are afflicted with mesenteric glands, either tuberculous or simply inflamed. Carson describes the pain as absolutely typical. "Sudden centralised abdominal pain, severe enough to make the child cry, lasting 15 minutes or less, relieved by pressure and hot applications, recurring perhaps two or three times a day and stopping as suddenly as it began, so that in the intervals the patient is quite free." The probable cause is colic pulling on the mesentery where it is tied to the inflamed gland. One cannot be dogmatic, but it is some satisfaction to be able to offer a reasonable explanation, and to express the opinion that time will usually cure the condition. Tuberculous glands in the neck would strengthen the diagnosis. If the glands are calcareous, they may show in a skiagram.

5. *Lumps in the abdomen.*—In a few cases tuberculous glands may be big enough to form an easily palpable swelling, rounded in outline, slightly tender, and fairly firm in consistency. The lump may be single, or there may be multiple masses filling the abdomen; I have seen one or two examples of both. The nature of the lump may be mistaken, and it will probably be explored. If it can be removed all is well, but sometimes it has to be opened for diagnosis and then cannot be removed. It is a grave error to leave it within the abdomen to overlet tuberculosis; I have heard of tuberculous peritonitis as a result. Under these circumstances I have stripped out the caseous material and sewn the edges of the gland to the anterior abdominal wall, thus preventing it and leaving it to do harm as it liked. The result was quite satisfactory.

[illegible] may lead to an abdominal catastrophe. One was recently reported by Sewell, in which a piece of [illegible] was perforated by the [illegible] [illegible]

if they are localised to the right iliac fossa or lie near the ureter they should be removed. The removal is not easy, because one must take great care not to crush or cut the gland itself, and the mesenteric arteries bleed freely. The gap must be sutured after the gland has been taken away. If it is adherent to the bowel it is better to let the gland alone, or a fistula may result. The appendix will, of course, be removed. If the glands are numerous, or if they look angry and acutely inflamed, it is wiser to leave them alone.

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THE "RANGE OF UREA-CONCENTRATION" TEST.

AN ANALYSIS OF RESULTS AND A SUGGESTED MODIFICATION.

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THE range of urea-concentration test introduced by Dr. E. G. B. Calvert in 1924 and fully described by him in January, 1925,[1] has now been in routine use for over three years in the wards of the Medical Unit of St. Mary's Hospital. It is thus possible to attempt an estimation of its value. As it is simple and easily carried out,* both for in-patients and ambulant cases, the test has received somewhat general acceptance as a valuable aid in the difficult problem of nephritis and renal efficiency. It is therefore of interest to analyse to what extent it is of actual assistance in such cases, what are its limitations, and how it compares with other kidney function tests, especially MacLean's urea-concentration test, of which it is a modification. For this purpose 75 patients have been studied; in each case the clinical condition has been carefully noted and results have been correlated with this and with other laboratory investigations—e.g., degree of albuminuria, blood-urea estimations, and, when possible, the post-mortem findings.

Calvert's test is one of renal efficiency as a whole only, and cannot give accurate information as to the exact pathological lesion, or precise portion of kidney tissue affected, in any given clinical condition. It is partly owing to this failure—common at present to all kidney function tests—that the pathological and clinical nomenclature in nephritis is so often confusing. Thus the clinical term "chronic interstitial nephritis" may represent histologically a late stage of parenchymatous—i.e., glomerulo-tubular nephritis—or a condition which is essentially arterio-sclerotic. I have considered such cases under the two general pathological names "small white" and "small red," the former including the "primary contracted" group of Rose Bradford. These correspond approximately to the two clinical types of German authors (Schlayer[2] and Fahr[3]), "malign sclerosis" (the white arterio-sclerosis of Volhard), and "benign" hypertonia or "red" arterio-sclerosis. The former is the true glomerulo-nephritis in its third or contracted stage, and follows the so-called parenchymatous nephritis (second stage) of "large white kidney" which clinically produces the hydræmic type of nephritis, characterised by albuminuria, œdema, and chloride retention. This group is little represented in this series and in its pure form—nephrosis—seems increasingly uncommon. Of these three groups—the "small white," "small red," and "large white"—it is in the first that Calvert's test is of the greatest value, though it may also be of assistance in the differentiation of groups 1 and 2, which is often a matter of considerable clinical difficulty. It is perhaps least reliable in group 3.

The results of the range of urea test represent the maximum concentration of urea in the urine following a dose of 15 g. of urea, and the minimum concentration following the taking of a pint and a half of fluid. In order to correlate these figures in some degree I have suggested the "urea index" as a convenient single number to gauge approximately their relationship. By the "urea index" is meant the value of the urea range—the difference between the maximum and minimum figures—as a percentage of the maximal concentration. This is of particular service in the recognition of the presence and degree of nitrogen retention.

Groups 1 and 2 (cases of "chronic interstitial nephritis" showing cardiovascular change with high blood pressure).

In the majority of these cases—43 out of 53, or 81 per cent.—MacLean's figure (maximum urea concentration) is low, 2 per cent. or less, and they may be divided from the point of view of the range of urea test into two types, which correspond with some closeness to the groups 1 and 2 described above. In the first the urea range shows a parallel diminution with that of the maximum concentration; in the second a poor "MacLean figure" is accompanied by a relatively good range—i.e., a high urea index. Of these 43 cases, which all have a maximum concentration not greater than 2 per cent. (above this percentage kidney efficiency is by many considered as normal (Elwyn),[4] (Beaumont and Dodds)[5]), 34, or 79 per cent., show a range of under 0·5 per cent. with an index in no case greater than 25. The remaining nine cases having this low MacLean figure but a urea index over 25 all have a blood pressure much above normal, six, or 66 per cent., of them with systolic readings of 220 mm. or higher. All have normal blood-urea values except one (87 mg. per 100 c.cm.). Seven show marked arterio-sclerotic changes in the retina; one only shows some degree of "albuminuric retinitis," and in this case alone is any history of previous kidney disease recorded. The average age of these patients is 57 and all show thickened palpable vessels; not one has come to post mortem. This group, therefore, appears with one exception to correspond rather to the "small red" than to the "small white" group.

Early Detection of Renal Insufficiency.

Of the former 34, 27, or 80 per cent., have blood-urea values above normal (greater than 40 mg. per 100 c.cm). Sixteen have indices of 10 or under, and all of these show values above 70 mg. per 100 c.cm. The five autopsies among the 34 all show fibrotic changes of the kidney of the true contracted glomerulo-nephritic type without marked atheroma of the small vessels. Fifteen of these cases (44 per cent.) show retinal changes typical of chronic nephritis (exudation and hæmorrhages of albuminuric retinitis). Only one case among all those showing definitely renal retinitis has a urea index above 21. In these cases, therefore, the urea index is seen to bear a close inverse proportion to the degree of nitrogen retention: under 12 it is always associated with a blood-urea above normal, while above 25 it appears to suggest the "small red" rather than the "small white" kidney, and to be strong evidence against the presence of any but very slight nitrogen retention. In this respect the test confirms the view (Schlayer) that the "benign" essentially arterio-sclerotic kidney ("nephro-cirrhosis arterio-sclerotica"), which is clinically so difficult to distinguish from the early malign or "secondary contracted" type, retains a better diluting power than the latter, which shows a constant polyuria but fails to produce good excretion of an added dose of water. This failure of "excess water excretion"

* A description of Calvert's test is given at the end of this article.

points to the presence of an "inflammatory" condition of the kidney, which is borne out by Calvert's test in which the second specimen (B) of urine does not show dilution much below the first.

The criticism, therefore, that has been levelled at MacLean's test—that it does not detect renal insufficiency until it is somewhat pronounced (Bain)[6]—can be applied with less justice to Calvert's test, which is sometimes able to detect changes pointing to early contraction of the kidney before MacLean's test arouses suspicion. Thus of ten cases clinically diagnosed as belonging to the group "chronic interstitial nephritis," but showing little impairment by MacLean's figure—i.e., maximum concentration above 2—five show also a good urea range (urea index above 25). The remaining five are of especial interest since, with a maximum concentration between 2 and 3 (or higher), the additional evidence of the range of function may enable us to detect "failing" kidneys that MacLean's test will adjudge as sound. Such early defect of range, though pointing to true secondary contraction of the kidney, does not always justify a much worse prognosis than in the former five with good range, and as the disease progresses the range falls pari passu with MacLean's figure.

The following examples illustrate these points, the first two (*a*) taken from the group of 43 showing impaired maximum concentration, the last four (*b*) from the ten cases mentioned above, with no impairment of maximal concentration.

(*a*) With impaired maximum concentration.

Group 1.—"Small white" kidney (impaired maximal concentration and impaired range).

Male aged 44; albuminuria 0·15 per cent.; history of nephritis; no œdema; systolic blood pressure 225; severe "albuminuric" retinitis; urea concentration: maximum and minimum, 1·1 per cent. each=range 0; urea index 0. Blood-urea 300 mg. per 100 c.cm.

Post-mortem Report.—"Kidneys small, fibrotic, contracted, granular. Contain multiple subcortical cysts; capsules strip with difficulty, leaving a finely granular surface; cortex very pale and markedly diminished."

Group 2.—"Small red" kidney (with impaired maximum concentration, but unimpaired range).

Female aged 56. Traces of albumin; slight œdema of ankles; no casts; vessels thickened; systolic blood pressure 190; no retinitis. Urea concentration: maximum 1·8 per cent., minimum 0·6 per cent.=range 1·2; index 68. Blood urea 27 mg. per 100 c.cm.

(*b*) With no impairment of maximum concentration.

Female aged 31. No œdema; albuminuria 0·2 per cent.; casts present. Blood pressure 190/140; retinitis; history of pregnancy—toxæmia; pericarditis. Urea test: maximum 2·0 per cent., minimum 2·1 per cent.=range 0·23; index 9. Blood-urea 53 mg. per 100 c.cm.

Male aged 61. No œdema; albumin present; no casts. Blood pressure 220/140; retina "arterio-sclerotic." Urea test: maximum 2·9 per cent., minimum 2·2 per cent.=range 0·7; index 24. Blood-urea 55 mg. per 100 c.cm.

In these two cases clear evidence of impairment is shown by Calvert's test, in contrast to MacLean's figure. The following show both good maximum figures and good range.

Male aged 50; no œdema; albumin and granular casts present. Blood pressure 210/135. Urea concentration: maximum 3·1 per cent., minimum 1·3 per cent.=range 1·8; index 58. Blood-urea 30 mg. per 100 c.cm.

Six months later this case showed the first sign of renal deficiency—detected at once by Calvert's test; maximum 2·9 per cent., minimum 2·2 per cent.=range 0·6; index 21. At that time the blood-urea was 50 mg. per 100 c.cm. and some retinitis was present.

Female aged 52. No albumin; no casts; blood pressure 240/140; retina normal. Urea test: maximum 3·1 per cent., minimum 0·3 per cent.=range 2·8; index 71. Blood-urea 41 mg. per 100 c.cm.

Further cases would show in the same way with what extra evidence the good urea range in association with the good MacLean figure enables us to report "simple renal involvement." In cases of "small white" or "small red" kidney, Calvert's test is thus of value as an estimate of the severity of the condition, as some guide in differentiating the two groups, and as a useful index of nitrogen retention. A good maximum concentration with a good range is characteristic of arterio-sclerosis with no renal insufficiency; an impaired maximum concentration with a good range of arterio-sclerosis *with* renal involvement (renal arterio-sclerosis or "small red" kidney), a bad maximum concentration with a bad range, of true "malign" contracted or "small white" kidney. Its prognostic import and its slight though definite advantages over MacLean's test are clear.

Value of the Test in Parenchymatous Nephritis.

In acute nephritis only the severer grades show impairment of function by Calvert's test, but its value should be most apparent in subacute parenchymatous nephritis or "large white" kidney. Calvert states that the range is limited, though set at a high level, and it should thus give more information than MacLean's figure, which is normal or high in these patients. Its results are, however, somewhat conflicting even though, as emphasised by Calvert, they are always viewed in conjunction with all the clinical data available—especially with respect to circulatory failure. A feature of these cases is impaired water excretion, and, though Calvert's test gives some estimate of this impairment, it can only be viewed as a modified water-test, as used so widely on the continent (Rosenberg)[7], Volhard).[8] In some of these cases the urea range is found to be surprisingly good, and this appears to be partly due to the varying diuretic effects of excessive water-drinking, which in many cases acts as a somewhat short-lived stimulus, while in others the effect is spread over a longer period. A healthy kidney will excrete a draft of 30 oz. of water within three and a half to five hours; some excrete the majority, say 20 oz., within one and a half hours, others excrete relatively little during the first hour, and the main bulk during the second and third hours, and this is the most usual response (Schlayer). The examination of any one given hourly sample—or a sample of the total first two hours' output as in Calvert's test—does not therefore give so good an idea of the power of water excretion as does the study of the total response over a longer time, such as is obtained by the performance of Volhard's simple "Wasserversuch."

Calvert's original test, however, takes little note of these factors and must thus be considered incomplete, though the results of such water tests—however thorough—cannot alone elucidate the conditions underlying these results, which may be produced either, for example, by passive congestion of the kidney or by "chronic parenchymatous nephritis." An example may make this clear. A short lasting diuresis produced a low urine urea percentage, giving a Calvert minimum figure of 0·8 per cent., while by Volhard's water test more than 450 c.cm. (of the 850 c.cm. given) were retained at the end of ten hours, in spite of this temporary dilution.

Male aged 14. Slight œdema; blood pressure, 95/70; albumin and casts present. Urea-concentration test: maximum 5·8 per cent., minimum 0·8 per cent.=range 5; index 86.

Total urine excretion and specific gravity after 30 oz. of fluid, at hourly intervals: (1) 3 ii., 1025; (2) 3 iv., 1010; (3) 3 iv., 1009; (4–6) nil; (7) 3 ii., 1035; (8–10) 3 i., 1035.

For these reasons Calvert's test may give fallacious results and should, therefore, be combined as a routine with urine estimations, as in Volhard's test. The hourly output should always be measured and its specific gravity noted until the total amount of fluid given (30 oz.) is excreted, or until the lapse of at least ten hours. Even in its original form, however, Calvert's test can often be of help, and the following examples demonstrate its usefulness.

1. Male aged 17. Acute nephritis with œdema, hæmaturia, and albuminuria. Successive tests gave (a) maximum 1·6 per

cent.; minimum 1·2 per cent. = range 0·4; index 25. Blood-urea 56 mg. per 100 c.cm. (*b*) Maximum 2·75 per cent.; minimum 1·55 per cent. = range 1·2; index 44. Blood-urea 56 mg. per 100 c.cm. (*c*) Maximum 2·75 per cent.; minimum 0·85 per cent. = range 1·9; index 70. Blood-urea 41 mg. per 100 c.cm. And at the same time albumin and casts disappeared from the urine and a clinically perfect recovery was made.

2. Male aged 36. "Acute nephritis"—œdema; albumin ++, blood pressure 160/120. While in hospital the test gave: (*a*) Maximum 2·07 per cent., minimum 0·65 per cent. = range 1·40; index 70. Blood-urea 16 mg. per 100 c.cm. And later: (*b*) Maximum 3·15 per cent.; minimum 1·85 per cent. = range 1·30; index 43.

Here the test suggested some "parenchymatous change," and in two years' time the patient showed marked water retention, some œdema and albuminuria, and the test gave the following figures: Maximum 4·2 per cent., minimum 4·0 per cent. = range 0·2; index 4·5.

3. Female aged 21. Subacute nephritis; albumin 2 per cent.; many casts; urine scanty; blood pressure 100/90. Test results: maximum and minimum 4·2 per cent. each = range 0; index 0.

Marked clinical improvement was accompanied by the following figures: Maximum 4·45 per cent.; minimum 1·75 per cent. = range 2·70; index 60.

Four years later the patient had no albuminuria and no œdema and the test showed: Maximum 3·1 per cent.; minimum 0·8 per cent. = range 2·3; index 74.

She was then in excellent health and no casts could be found in the urine. Here the good prognosis, as judged by Calvert's test, appears to be fully justified.

In a few cases, however, the test has proved actually misleading, and the second specimen has shown a good dilution of urea.

Female aged 10. Moderate œdema; albumin 1 per cent.; casts present. Systolic blood pressure 118; blood-urea 47 mg. per 100 c.cm. Test gave maximum 2·9 per cent.; minimum 0·6 = range 2·3; index 79.

Renal function was apparently efficient, but at autopsy shortly after the test the report was: "swollen, pale, large, white kidneys." Had the full water estimation been performed there is little doubt that the good diuresis at two hours in this patient would not have continued, and a truer idea of the renal function would have been obtained.

With the modification suggested, however, more reliable and consistent results may follow and permit of clearer judgment of kidney function in these difficult cases, which offer a diagnostic and prognostic problem that Calvert's original test has not been able regularly to solve.

Calvert's Test.

The patient takes his usual food, but no fluids from 12 noon. At 9 P.M. the bladder is emptied and 15 g. of urea are drunk in 4 oz. of water; at 10 P.M. the bladder is again emptied and the urine discarded. The patient then goes to bed and all the night urine, together with that passed on rising—say 7 A.M.—is kept. A sample (A) of these mixed portions is analysed for its urea content. The patient then drinks 30 oz. of weak tea or water and the urine passed up to the end of two hours—9 A.M.—is kept and a sample (B) again analysed for its urea percentage. The two specimens A and B represent the maximum and minimum concentrations of urea in the urine and the difference between them the urea range.

I am greatly indebted to Prof. F. S. Langmead for permission to investigate these patients, who have all been under his care, and for his kindness and assistance to me in the preparation of this paper. I am also indebted to Dr. E. G. B. Calvert, who performed the greater number of these tests.

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AN INTRODUCTION TO THE MECHANISTIC CONCEPTION OF ECLAMPSIA.

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It is safe to say that Matthews Duncan's teaching has had a profound and lasting effect on obstetric thought. When an undergraduate I read with some assiduity his clinical lectures, and was especially struck with his conception of the retentive power of the abdomen. He believed that during pregnancy the base of the thorax expands and aspirates the uterus upwards; thus, as pregnancy advances, the pressure above the uterus being constantly negative, the organ naturally grows upwards. The liver, being placed between the diaphragm and uterus, simulating, if you like, the sucker of a syringe, according to this hypothesis must itself be drawn upwards by the thoracic aspiratory effect, and thus is not compressed during pregnancy. He unconditionally rejected the conception, promulgated in his day even by "good authors," that the gravid uterus induces a pressure on the liver, "disordering its functions" and leading to disease.

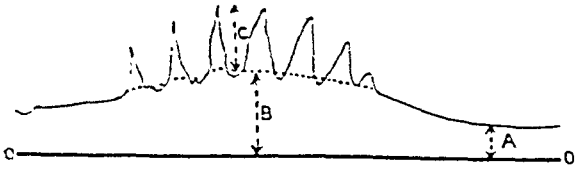
Men state, "as if it were a fact," he said, "that there is great pressure upon the liver and upon the kidney in pregnancy, and proceed to reason upon this, not only to found theories of disease upon it, but also plans of treatment, and all the time they have never given even the slightest good reason for believing that there is any increase of pressure.... There is no evidence, but rather to the contrary, that there is any increase of pressure upon the liver or kidney in pregnancy. Indeed, f you turn to the clinical view of the matter and regard cases of large fibrous tumour and of large ovarian dropsies, you will see nothing to confirm the belief that pressure has anything to do with producing disease of the liver or of the kidneys, for in these cases, you might expect far greater pressure than in pregnancy, in consequence of the frequently far greater size of the tumours."[1]

The criticism was accepted by everybody. It nullified all research on the dynamics of the abdomen, a research affecting the whole of internal medicine, and it deviated obstetric thought, qua eclampsia, into a long, devious, and fruitless quest for a primary and specific toxin, which now remained the only possible determinant. Yet the simplest examination serves to show the error of Duncan's view. In my innocence, very many years ago, long before I began my serious academic career, I inserted a rubber bag, filled with water, into the vagina of a woman lately confined. The bag was connected with a long glass tube, which was held vertically, and also contained water. I then caused the woman to rise from her bed, and expected to see the effect of the retentive power of the abdomen. Great was my surprise to see the water shot from the tube to the ceiling. It was clear that during the puerperium, at any rate, and with the change of position from the horizontal to the erect, the retentive power of the abdomen was not manifest. Later examinations with a mercurial manometer of women advanced in pregnancy displayed beyond dispute that the pressure in the rectum, except in some subjects with lax abdominal walls in the knee-chest position, is always greater than the atmospheric, and in most positions is markedly greater. It is perhaps not surprising to find in the erect position in late pregnancy, even with the woman at ease, a raised pressure in the depths of the pelvis, but it is surprising to discover pressure values in this part almost as great when the woman is lying at ease on her back. Even when she has turned on her side and is not straining, the pressure in the rectum, though less than when in the dorsal decubitus, is still greater and often considerably greater than the pressure in the rectum in the non-pregnant woman with flat abdomen in the same position. Such pressures are not consonant with the

[1] Duncan, Matthews: On Hepatic Disease in Gynæcology. Lond. Med. Times and Gazette, 1879, i., 57.

conception that the uterus is aspirated upwards during pregnancy. The reverse is the case. Supported by the pelvic floor, which hypertrophies during pregnancy, the uterus distends upwards, displacing surrounding parts with the force it exerts: these in turn displace outwards and upwards the confining structures, the abdominal wall and thoracic diaphragm, according to their resistance. The greater this resistance the less easy is the uterine expansion and the smaller the child. Clearly, according to this resistance, so must the compression of the intervening viscera—the liver and kidneys vary. When the abdominal walls give way easily the compression may be no more than in the non-pregnant, but if the resistance is considerable, as is usual in primigravidæ and in cases of unduly rapid uterine distension (as in twins, hydramnios, or concealed accidental hæmorrhage), the compression of these viscera can easily become greater than under other conditions.

During labour the pressure within the abdomen must intermittently be greatly raised. The strains of labour differ only in degree from the strains of pregnancy—the strains of running the house, lifting coal, carrying trays, and defæcating. The strains of pregnancy persist throughout several months and are less intense than those of labour. The strains of labour are often great, usually with intervening periods of complete rest, at times of marked fatigue or even exhaustion. During these strains the liver and kidneys must always be greatly compressed. Even Duncan, who computed the force exerted during parturition to expel the child, could not and did not impute this to the uterine activity alone.[2] During the expulsive stage the pressure within the uterus is raised with the uterine contraction, but superadded to this there are elevations of pressure almost equalling



Pressure tracings after de Bruyn (quoted from Bournay, p. 131). The pressure changes within the uterus during an expulsive contraction are shown. (A) represents the pressure during the interval between the pains; (B) represents the pressure due to the action of the uterine contraction plus (A); (C) that due to the contraction of the abdominal walls and diaphragm.

those caused by the uterine contraction, due to the contraction of the abdominal parietes, as shown by Bournay's tracing (from an animal) after de Bruyn's (see figure).

It was a misfortune for medicine that Duncan's opinion was accepted without question. The men whom Duncan opposed had a very good reason for their belief that the pressure on the liver in some cases is increased in pregnancy and that it causes pathological changes. They knew that puerperal convulsions are predominantly in the most robust and strong primigravidæ. Moreover, Lever[4] (1843) had shown that the abdomen varies in size and figure in different women at the same period of pregnancy, and argued that the pressure caused by the pregnant uterus is not always the same. The condition of the abdominal wall clearly comes into the question; if the abdominal wall is strong and resists the distension, the pressure within the abdomen and on all the viscera must be greater than when the abdominal wall is weak and [illegible] resistance to the distension. The same [illegible] to the thoracic diaphragm. The diaphragm [illegible] pressure down on the epigastric viscera—[illegible] in the stomach, in the chest pains, is [illegible]. Only in [illegible] in which [illegible] in the chest posture, is the pressure within the stomach negative. In pregnancy, if the abdominal wall persistently resists the uterine distension, the thoracic diaphragm must do more work, must press down on the liver with a greater force, than in the non-pregnant—even during resting states. The diaphragm has to prevent the epigastric viscera from encroaching on the chest; if it did not do this, the blood in the inferior vena cava would not be forced in sufficient amount per unit of time into the right heart and the circulation would cease. Paralysis of the diaphragm, even in the non-pregnant with flat abdomen, is not compatible with life.

Deductions from Evolutionary Studies.

It was, however, a study[5] of the levator ani muscles which led me to appreciate the significance of the intra-abdominal pressure and form the mechanistic conception of eclampsia, which is fundamentally based on evolutionary metabolic deductions. It had been thought that the levator ani muscles in man are simply vestigial structures, representative of tail-moving muscles in tail-bearing ancestors of man. Inquiry showed that this view was altogether untenable; that their essential purpose is to guard the pelvic outlet, acting in many animals as an obturator preventing visceral escape, especially during activity. The only explanation of the flank muscles of the abdomen was (and is) that for some reason they compress the abdominal viscera. The existence of the flank muscles explained the existence of the levator ani. Obviously the flank muscles could not create much pressure within the abdomen if the viscera were not prevented from being extruded from the pelvis. Nor could the abdominal wall contract much if the epigastric viscera were not prevented from entering the chest. Thus, the diaphragm appeared as an antagonist of the abdominal wall, creating with it a positive pressure within the abdomen, and not simply as an antagonist of the thoracic wall participating in the production of a negative intrathoracic pressure. Plainly the negative pressure in the chest and the positive in the abdomen are correlated for some end.

This state of the body, most advanced in man, is but the end of a long progressive change. If one examines the vertebrate series, passing from the amphibia to the mammal, one finds that the pelvic floor advances in structure; that the abdominal wall, in which the flank muscles are early differentiated, increases in strength; that ribs in the head-end of the cœlomic wall develop; and, finally, that the thoracic diaphragm appears and undergoes advancing changes. For what purpose and how did all this occur? Even in amphibia the pressure within the abdomen must be positive. Clearly ribs appeared in pre-reptilian amphibia in order to diminish the pressure within the head-end of the body cavity. Simultaneously the pressure in the caudal end of the body presumably became greater, more positive, because of the concomitant development of the abdominal muscles. The permanence of these changes stabilised the reptiles. Whilst the diminution of pressure anteriorly facilitated the entry of air into the lungs (but not expiration), it also facilitated the entry of blood into the heart. With the appearance of the diaphragm in mammals the epigastric viscera were thrust caudalwards and the mechanism whereby the blood in the abdomen was returned to the heart was enhanced. The output of the heart depends beyond all else on the return of venous blood. Blood cannot pool within the skull, or within the limbs as it can within the abdomen; the rise of the intra-abdominal pressure and the concomitant diminishing intra-thoracic pressure throughout the vertebrate series is manifestly correlated with the necessity—at least, with the occurrence—of a progressively increasing circulation.

The improvement in the circulation was correlated with the advance in the manner of living. From the

slowly moving, awkward, and almost clumsy terrestrial amphibian, its body resting for the most part on the ground, we pass to the highly active mammal, so conspicuous for its agility, strength, and grace, its body maintained with ease above the ground. The overcoming of the force of gravity was first made manifest by land life. The fish has its body supported by a medium of like specific gravity to itself. The overcoming of the dreadful fatigue of movement in a medium by which the animal was no longer supported could only have been possible by an increase in metabolic rate. That this occurred is apparent when we compare the warm-bloodedness of the mammal with the cold-blooded state of the pre-mammalian vertebrates. The viscera were obviously involved in the process. In the evolution of the vertebrates we have a progressive advance of the whole visceral machine. Mention has already been made of the advance in structure of the body walls. The viscera also became more efficient, particularly the heart. From a pulsating part of the vascular tube it became a four-chambered organ. As the return of blood to the heart became greater from increase in activity and the necessity of moving faster, the blood required more efficient oxidation; the changes in the heart were presumably determined by increasing peripheral demands. In the endeavour to make new and greater movements the work of the other viscera must have correspondingly augmented. An increased visceral interchange—in the liver, kidneys, and other abdominal organs—must of necessity have come into equilibrium with the establishment of each order.[6]

Thus I came to formulate the wider generalisation that the intra-abdominal pressure is related fundamentally with general metabolism. The greater the intra-abdominal pressure the greater the return of blood to the heart, the cardiac output, and the aortic pressure, unless the peripheral resistance could be more readily overcome. Thus the better is the supply of blood to the brain, to the limbs, to the abdominal viscera; the whole animal becomes more efficient and active. This end was subserved by the development of the skull (the function of which is mainly circulatory), and of the aponeurotic sheaths of muscles (which exist certainly for the same end); the negative pressure in the chest (in virtue of which the pressure of the air in the alveoli becomes operative, compressing the pulmonary capillaries against the thoracic walls, even causing indentations, due to ribs, on the lung surfaces); and the active compression of the viscera in the abdomen. The greater the capillary compression, within limits, the better the blood flow through these channels.

The capillary blood flow is the most important part of the whole circulation and certainly must have become more efficient in the process of evolution, but increased arterial blood pressure alone would not explain this. An increased blood pressure in the arteriole supplying a capillary bed is not the only condition determining an increased blood flow through the capillaries of that bed. It would simply result in a distension of capillaries, a pooling of blood in the capillaries and small veins, and even rupture of these vessels—as occurs in "shock." A compression of the capillaries is necessary for the maintenance of an onward flow and an increased compression, within limits, for an increased flow. Too great a compression of any one capillary bed, however, could easily result in an obliteration of the capillaries and the escape of aortic blood through other channels. If, during evolution, the compression of the abdominal viscera had become persistently too great, a diminished blood flow through the abdominal viscera would have resulted and the blood would have escaped through other parts—through the limbs and the brain. A nice adjustment must have been necessary; only when an adequate resistance in the limbs and the brain had occurred could an increased compression of the abdominal viscera have been tolerated. Conversely, only when a sufficient compression of the abdominal viscera had become possible could an enhanced cerebral blood flow have occurred. When the pre-gibbons began to travel by swinging, using only their arms for locomotion—i.e., when a centrifugal force, plus the effect of gravity, began to play on the blood stream—a great development of the abdominal muscles must have occurred; otherwise the cerebral circulation would have become insufficient for the maintenance of consciousness. The evidence is that the blood flow through the brain became greater than was required for the immediate needs of the animal.

Obviously, too, a nice adjustment between the arterioles and their capillary beds was a necessary condition. The capillaries are thin-walled structures because they thus afford the best means of rapid interchange between the tissue cells and the blood, therefore the pressure of the blood in the capillaries must always be approximately the same as that outside, caused by the activity of the tissue cells or the pressure which these cells transmit to the capillaries through being themselves compressed (as by capsules of organs or by the walls of the abdomen). Whilst the pressure of the blood in the capillaries must be related to the calibre of the supplying arterioles (by which the blood pressure from the aorta is controlled), the converse is also true; the calibre of arterioles is related to the pressure in the capillaries they supply. When the pressure in the capillaries is low, because the tissue cells about the capillaries are inactive or the pressure on them is small, the arterioles supplying these capillaries are correspondingly constricted; when the pressure within the capillaries is high, because the tissue cells about them are active or are more compressed, the related arterioles dilate, so that a greater blood-supply to the organ and a greater blood flow through the organ can occur.

The Application of the Deduction to Man.

Thus the intra-abdominal pressure works in two ways. First, it affects the cardiac output by affecting the volume of blood returned per unit of time; secondly, it affects the capillary blood flow in the abdomen, by compressing the visceral capillaries. The conception that the intra-abdominal pressure is related to general metabolism seems warranted; therefore changes in this pressure, of any duration, should affect general metabolism. Diminution of the average pressure should be associated with diminution of strength and of general activity; increase of the average pressure, within limits, should be associated with increase of strength and capacity for greater work. In practice we find this is so. When the average pressure is low, when the muscles causing it have become weak, signs of general debility occur and the individual becomes neurasthenic or worse. An efficient abdominal support converts this cripple into an active and useful person. In the same way, when a woman with weak abdominal walls becomes pregnant, her whole state tends to improve. When the uterus has begun to bulge the abdominal wall the intra-abdominal pressure rises. More blood per unit of time being sent to the heart, more reaches the brain, the limbs, and the viscera. The capillary pressure in all parts rises, with an improved capillary blood flow. This explains the general improvement in physique and the brighter mentality so often noted as a concomitant of pregnancy. But if the pressure exceeds a certain limit the system must break. Capillaries here and there, and in certain places large tracts, become cut out from the circulation, the blood which should pass through them flowing through paths presenting less resistance. An aberration of metabolism must occur, and pregnancy seems to offer ideal conditions for its production. In the majority of cases, as pregnancy advances the abdominal muscles give way, as is shown by the separation of the recti

[6] In this respect it is interesting to read that in the elasmobranch fish the N.P.N. of the blood "amounts to 1000 mg. per 100 g. of blood, of which about 80 per cent. is urea nitrogen; the tissues likewise contain large amounts of urea. . . . Elimination by way of the kidneys is small, only 20 to 50 mg. of urea nitrogen per kg. being excreted in the urine by the starving dogfish in twenty-four hours." (Dennis: Note on the Tolerance shown by Elasmobranch Fish towards certain Nephrotoxic Agents, Jour. Biol. Chem., 1913–14, xvi., 395.)

in the latter part of pregnancy and by the condition of the abdominal wall after labour. But this is not always so; and in strong, busy, and active primigravidæ a sufficient yielding is especially unlikely. The conception that eclampsia is simply a manifestation of a gravely perverted metabolism, due to an excessive compression, preventing visceral activity, is supported by the facts that the levator ani muscles hypertrophy in pregnancy—particularly in primigravidæ; that the abdominal wall muscles undergo changes indicting the play of an increased tonic contraction (a spasticity, I have called it)[7]; that the pressure in the rectum becomes raised in some cases considerably; and that eclampsia occurs most often in the strongest type of woman, with good abdominal walls.

Those who still believe in the toxæmic origin of eclampsia admit that no direct proof can be advanced, and their indirect arguments are uncertain if not erroneous. Moreover, much positive evidence supporting the mechanistic conception has appeared. Even those who attribute ante-partum eclampsia to a specific toxin have been forced to take count of the visceral state to explain a post-partum eclampsia. But even for ante-partum eclampsia the conception of a primary specific toxin is neither necessary nor warranted. The fact that in eclampsia the liver and kidneys, par excellence, are the organs involved, that degenerative and even necrotic foci are commonly found—conditions so unlike those in really specific toxæmias—e.g., puerperal sepsis—supports the mechanistic conception. The fact that renal and hepatic aberrations usually or even invariably precede the convulsions shows that the visceral disability is primary; whilst the fact that similar aberrations (and lesions) may appear in the non-pregnant shows they are not due to pregnancy per se. Final proof is afforded by the association of the fits with the taking of foodstuffs, only to be explained by the absorption and transit of food products through a liver incapable of sufficient activity and their passage, insufficiently changed, into the systemic blood. A dog with an Eck's fistula develops convulsions although no poison is given with the food; nor in the healthy, active, busy, robust pregnant woman—the one that eclampsia especially selects—can it be believed that any specific toxin is in play.

[7] Intra-abdominal Pressure in Pregnancy, Proc. Roy. Soc. Med., Obst. and Gyn. Sec., 1913, vi., 291.

Clinical and Laboratory Notes.

NOTES ON CANCER OF THE STOMACH.

By GEORGE VILVANDRÉ, M.R.C.S. ENG.,
ASSISTANT RADIOLOGIST, LONDON HOSPITAL.

THE following remarks are based on experience extending over many years and embracing numerous cases of carcinoma of the stomach. The outstanding fact in the great majority of cases examined by X rays or seen at operation has been the widespread extension. As a rule, patients have come late for radio-diagnosis which, in my opinion, is second to none in the investigation of this disease. What has also impressed me has been the failure, sometimes of great clinicians, to give a definite diagnosis, even in advanced cancer of the stomach. This is not meant to reflect on their ability, but rather to point out the insidiousness of the malady, or the lack of symptoms pointing to a definite organ. One man of florid countenance with the appearance of full health and only complaining of a little indigestion was found, upon X ray examination, to have extensive and what proved to be inoperable malignant disease of the stomach. On the other hand, the picture of a thin woman, obviously losing weight and strength, anæmic and anorexic, failed to reveal to the clinician the true nature of her disease, even though occult blood was present in the stools. When X rayed, extensive carcinoma of the lower two-thirds of the stomach was found. Three years previously she had been diagnosed as suffering from "gastritis." The radiological examination strongly suggested that a perforating ulcer had been the starting-point. A diagnosis of "gastritis" should only be made when all other possibilities have been excluded, especially in a person over 45.

When obstruction is present either at the cardiac end of the stomach or (as is more common) at the pylorus end, the symptoms are much more insidious. So long as the lumen of the stomach is patent, the patient is unlikely to show drastic symptoms. In [illegible] to look for vomiting as a sign of gastric [illegible] to wait in vain. The pars pylorica is [illegible] involved in primary cancer, but the pyloric [illegible] involved often enough. In my [illegible] I have probably [illegible] ulcer [illegible] Barium [illegible] for the [illegible] less [illegible] than [illegible] usually [illegible] every case where there has been aversion from food. I have heard a surgeon state that because a man had no loss of appetite he could not have carcinoma of the stomach. This is going too far, for to wait for such a state of affairs is often to wait until the case is inoperable.

The most important and early sign in the X ray examination is the loss of peristaltic waves in a certain portion of the stomach, more often in the pars pylorica. "Half shadows" come later. Peristalsis ceases at the point where muscular is replaced by neoplasmic tissue. As the growth increases, the local contour of the stomach becomes abnormal. The replacement of the smooth curved contours of muscular viscera, like the stomach, by sharper lines or irregularities, however small, is one of the first diagnostic signs. This was well illustrated in one of my cases where a very slight defect was pointed out, but operation was postponed because the clinical picture was not really that of carcinoma. Some three months later the patient was X rayed again when I could confirm my previous findings more definitely. Operation was performed and a small carcinoma was found in the pars pylorica.

The Importance of Early Laparotomy.

Sometimes the clinical picture and the X ray evidence are those of comparatively restricted carcinoma, but on operation extensive secondary deposits are found studded over the liver, and post mortem this organ, together with the omentum and the peritoneum in the pelvis, may be widely infiltrated. To see such cases in the post-mortem room of a hospital makes one wonder whether some of the advocates of radium for the treatment of gastric carcinoma visit that department. The surgeon at least has a chance of a good look round and can estimate better than anyone the value of partial gastrectomy in a given case. An extensive case of carcinoma may appear inoperable under X rays because of its size and its position in the upper half of the stomach. Laparotomy, however, is in my opinion the only way of determining whether an extensive operation is possible or not. One case in particular justified it. Radiologically the case was inoperable. The patient, a medical man, begged Mr. Walton to give him a chance and take the risks and, although a large carcinoma was present, the patient wrote he was quite well a year later.

Neoplasms vary in their virulence and spread, and X rays can only show the lesion. Whilst the diagnosis of carcinoma can be made with certainty by X rays in a large proportion of cases, the majority of the small [illegible] neoplasms indeed [illegible] of a [illegible] Forsome years [illegible] Moynihan, Sherren, Walton and others that cancer may [illegible] upon a chronic gastric ulcer. The [illegible]

escape the naked-eye diagnosis of the surgeon, who may only find an ulcer, but sections of the excised portions may be found microscopically to show cancer cells. On the other hand, the operator may find definite evidence of malignant changes at the ulcer or glands on the small curvature. Clinically and radiologically, however, the picture may be only that of a chronic ulcer. The size of the ulcer is no criterion of its malignancy or innocence. Under X rays I have several times seen penetrating ulcers the size of half-a-crown or bigger, which have at operation and subsequent section proved to be benign, whereas smaller ulcers have been malignant. In none of these cases has X rays indicated anything but the presence of a penetrating ulcer, sometimes fixed to surrounding structures such as the pancreas or liver. The clinical evidence of the presence of cancer was not in any of these cases reliable. There is therefore, in my opinion, serious danger in the purely medical treatment of gastric ulcers. What may be wise medicinal treatment in a patient of 25 or 30 may mean disaster in an older one, whereas a timely laparotomy might show an early carcinoma on an old ulcer fit for excision. Carcinoma of the stomach in my series has occurred as early as the twenty-fifth year and the X ray findings were ultimately verified in the post-mortem room. Of the unfortunate patients who have carcinoma the less unfortunate are those whose pylorus is involved early, because they present definite symptoms. Repeated vomiting cannot very well be ignored, for when it is not relieved the patient usually seeks further advice.

Earlier Diagnosis Possible.

Carcinoma of the stomach appears to-day to be a dread disease and often fatal, but I am confident that, even allowing for the insidiousness of many cases, the greater proportion should not go so long undiagnosed. It has been written that no case of indigestion in a patient over 40 lasting more than three weeks or so should be allowed to go uninvestigated, and if this were better known and adhered to fewer mistakes would be made. Recently I have seen a woman who was in a hospital for six weeks and was sent out with the diagnosis of gastritis or possible duodenal lesion, and yet no test-meal had been given. Fourteen days after discharge from the hospital she had a well-marked carcinoma of the stomach.

The so-called "leather bottle" stomach, where the cancer cells are few and where gradual but very extensive fibrosis is present besides the neoplasm, appears to go longer undiagnosed than most. This is probably due to the lack of severe pain, the absence of bleeding, and the ready passage of the food through what looks under X rays like a rigid tube. On the screen the meal can be seen pouring from œsophagus to duodenum without a stop, but the lumen of the stomach is narrow and often irregular. The absence of peristalsis may be complete, for the muscular coat may be entirely replaced by neoplasmic and fibrous tissue. Most of these patients come too late for operation. There were a few, however, where this condition was localised at the pyloric end. In these, the X ray appearance may suggest syphilis of the stomach, which is rare in this country; a man may have a positive Wassermann and carcinoma of the stomach. The contention may be advanced that a filling defect of the stomach will be interpreted under X rays as carcinoma whether it be a malignant new growth, a polypus, or an adenoma. Although the differential diagnosis may not be made in the X ray room, the end-result should be the same—namely, laparotomy. In my student days we had impressed upon us the necessity of palpating the left supraclavicular fossa where a secondary gland might be found. Obviously this is a late sign, meaning that advanced lymphatic invasion has taken place, and X rays should avoid such a delay.

High gastric carcinoma may give rise to suspicion of œsophageal disease because of the symptoms of obstruction, but gastric pain is usually in the epigastrium, whereas œsophageal disease at the lower end of the tube gives mid-sternal pain, and a carcinoma of the œsophagus at the level of the bronchus gives rise to pain at the level of the manubrium sterni or higher. Spasm at the lower end of the œsophagus may be caused by an ulcer high up on the small curvature, whether benign or malignant, and no condition of œsophageal spasm should be considered completely investigated without examination of the small curvature. Carcinoma is not so much incurable as undiagnosed, and many more cures would be possible were the condition investigated earlier. It is the little signs that count, such as the rather indefinite indigestion in a patient over 40. In two patients in whom laparotomy was performed and inoperable cancer was found, together with numerous secondaries in the peritoneum, marked temporary improvement took place and the patients lived a year, one comfortably for most of that time.

NOTE ON THE REMOVAL OF ADENOMATA OF THE RECTUM.

By H. H. Greenwood, M.B. Lond., F.R.C.S. Eng.,
CONSULTING SURGEON TO THE GREAT WESTERN RAILWAY HOSPITAL, SWINDON.

According to Yeomans,[1] adenomata of the intestinal tract occur most frequently in the rectum, ileum, colon, ileocæcal valve, and duodenum. The subject has recently been reviewed by Lockhart-Mummery[2] in his presidential address to the Proctological Section of the Royal Society of Medicine. The tendency to malignant change in these apparently innocent growths, even when appearing as solitary tumours, lends them a sinister significance. In all situations save in the rectum, excision of the affected portion of bowel wall is done logically and without hesitation, in the hope of anticipating any tendency to local spread. In the rectum proper simple snaring or ligation of the pedicle with excision by the anal route[2 3 4] is usually advocated and practised. For those tumours situated at a high level, Lockhart-Mummery advises excision of the coccyx and the laying open of the rectum from behind to gain full access. Unless, however, a margin of healthy bowel is taken with the tumour, these measures seem to be inadequate, and to disregard the known tendency to malignant change. When an adenoma is found lying on the anterior wall of the rectum above the level of the reflection of the peritoneum at the bottom of Douglas's pouch—that is, at any distance greater than 1 in. from the anus—removal

Fig. 1.

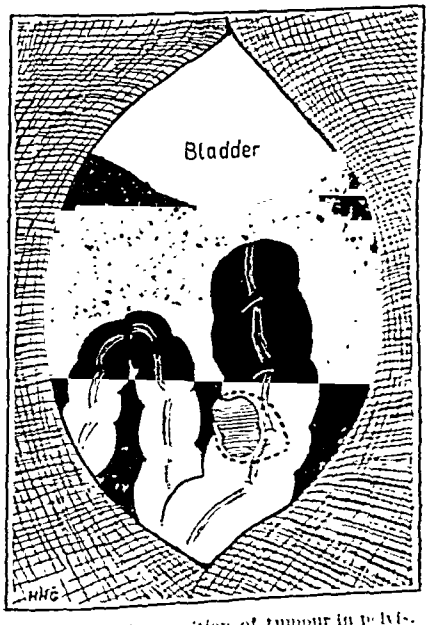


Diagram showing position of tumour in pelvis. On the left is a loop of pelvic colon; the dotted line indicates the line of section around the tumour; and above this the rectum is seen descending in relation to the bladder.

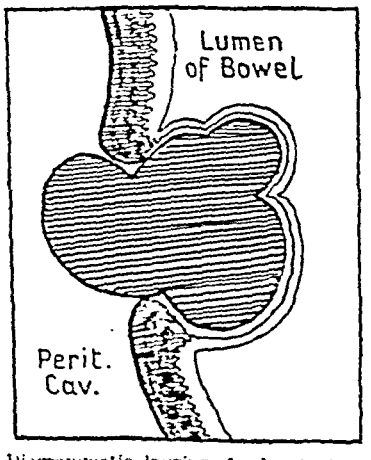
even by simple ligature and excision is not altogether free from the risk of opening the peritoneal cavity and inviting consequent infection by leakage.

Myomata develop in the same submucous layer as do adenomata, and while they usually grow towards the lumen of the bowel, they sometimes tend to grow outwards and to invade the peritoneal cavity.[5] In like manner an adenoma, solitary and showing neither gross nor microscopic sign of malignancy, can refuse to follow the line of apparently least resistance towards the lumen of the rectum, but may project, uncovered by peritoneum, into the peritoneal cavity.

I can find no record in the literature of any case resembling the following, which exemplifies the possibility of an innocent adenoma violating the integrity of the peritoneal covering of the bowel.

A man, aged 21, who was referred to me by Dr. W. Binning, complained of constipation, the passage of small quantities of blood in the stools and tenesmus—a feeling of incompleteness and aching pain in the rectum after defæcation. Curiously enough, a definite history of these symptoms only extended over the preceding five or six weeks. With the sigmoidoscope a sessile tumour could be seen bulging into and almost occluding the lumen of the pelvic colon about 8 in. from the anus. The broad base and flat domed shape of the tumour precluded any attempt at snaring or any other manœuvre which might pull on the bowel wall and so involve the risk of dragging down a pouch of peritoneum.

FIG. 2.



Diagrammatic drawing of a longitudinal section of the tumour, showing the mucous membrane, the muscular layer of the gut, and the peritoneum. A groove is seen around the tumour, which is uncovered by peritoneum.

On June 9th, 1928, the abdomen was opened and the tumour, bright red in colour and about the size of a walnut, was found projecting from the left antero-lateral wall of the pelvic colon. The bowel wall ended abruptly at the edge of the growth, around which was a shallow gutter (see Fig. 2). After snipping round the edges, the tumour came away readily, leaving a large oblique hole in the wall of the bowel. Trimming the margins of the wound caused a hemicolectomy of the bowel, which was closed by three layers of fine catgut sutures. To safeguard against leakage a cecostomy was done; a large rubber tube was passed up from the anus until the end reached a point 2 in. beyond the sutures, and a small drain leading down to the pelvic floor was left in the lower angle of the abdominal wound.

The rectal tube remained in situ for six days; the cecostomy closed at the end of a fortnight, by which time the abdominal wound was soundly healed. Inspection and palpation of the rectum and sigmoid revealed no other tumours, and any other growth be seen later through the scope. The patient is now free from symptoms.

The pathologist's report states that the tumour is a simple adenoma, free from any sign of malignancy, and that [illegible] there is no trace of malignancy. It is probable that removal by the snare, or even by the more radical excision of the posterior wall of the rectum, would have left a large gap of bowel wall exposed, and would have [illegible] the risk of [illegible].

A case has recently been reported by Gordon-Watson, in which he advised the old men to gain access to the tumour through the good rectal of the [illegible] 12 in. from the anus; by pushing [illegible] the tumour [illegible] to be removed. [illegible] and that a margin of healthy bowel should be excised with the tumour if there be any evidence of involvement of the peritoneal covering. The risks attending resection, provided that an adequate peritoneal toilet be observed, appear to be less than those incurred by the approach from within the bowel. If the growth in this case attained its peculiar position by invasion of the wall, it would appear to have done so by virtue of a nascent malignancy too subtle to be betrayed by gross cellular changes.

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AN UNUSUAL RESULT FOLLOWING INJECTION TREATMENT OF VARICES.

By F. REYNOLDS, M.B. MANCH.

THE following case may be of interest:—

A woman, aged 25 years, commenced treatment in May, 1928, and, according to my custom, attended once weekly for injections of quinine urethane solution. Two injections were given each week, and the patient was discharged in June. The vein under treatment was the external saphenous, which was markedly varicose from ankle to knee. By the end of June the whole vein was obviously thrombosed by the injections, and the patient was asked to return in eight weeks time in order that I could inspect the result.

She returned in September, and to my surprise I discovered that in place of the now obliterated vein was a remarkable overgrowth of hair which exactly followed in each curve the line of the original vein. The hair differed in two respects from the natural hair of the legs: in the first place it was both longer and denser; and, secondly, it was decidedly darker in colour, so much so that the patient suggested that she should shave her leg in future.

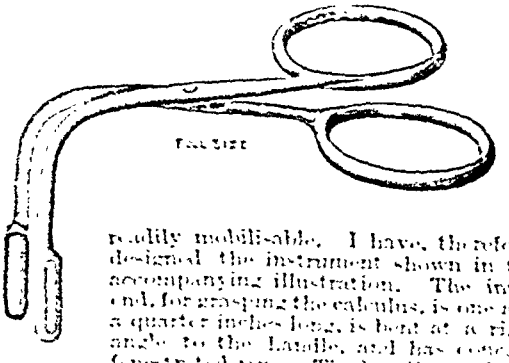
Although I have carried out over 500 injections this year this is the first time I have observed such an occurrence.

Manchester.

New Inventions.

PYELOLITHOTOMY FORCEPS.

WHEN removing calculi through an incision in the renal pelvis, I have often found difficulty in manipulating the ordinary type of forceps, especially if the patient is stout, the pedicle short, and the kidney not



readily mobilisable. I have, therefore, designed the instrument shown in the accompanying illustration. The inner end, for grasping the calculus, is one and a quarter inches long, is bent at a right angle to the handle, and has concave fenestrated jaws. The handle portion is two and a half inches in length. With such an instrument one can work in a much more limited space than with a straight or nearly straight type.

The instrument is [illegible] by Messrs. Allen and Hanburys, Ltd., 37 Worship Street, London, W.1.

W. K. [illegible], F.R.C.S., F.[illegible]

THE PANEL CONFERENCE.

MEDICAL CERTIFICATES OF INCAPACITY.

THE annual conference of representatives of local medical and panel committees was held on Oct. 25th at the House of the British Medical Association, with Dr. E. K. LE FLEMING in the chair. On the report of the Insurance Acts Committee (I.A.C.) an important discussion arose on

Excessive Sickness Benefit Claims.

Dr. H. G. DAIN (chairman, I.A.C.) said it was very serious that after 15 years of National Health Insurance there was a continuing rise in the number of claims for sickness benefit. As the people primarily responsible for certification, panel practitioners naturally came in for criticism by outside bodies. To everyone else concerned in working the scheme it was an attractive theory that medical men were to blame for the increase; even the Minister of Health and his officials had implied in their speeches that the fault lay largely with those who issued the certificates, whilst at every conference of the approved societies responsible people got up and made charges against the medical profession. It was certainly extraordinary that the claims should have risen so greatly in the absence of epidemics or any general increase in morbidity, but the Ministry now agreed that the first cause of the rise was not defective certification, and Sir Walter Kinnear in his public statements placed it quite low down on the list of causes. The I.A.C. had made it clear to officials of the big approved societies that it was anxious to help in reducing the number of claims, provided they on their part agreed to speak temperately about the medical profession. It was wrong that the public should be constantly told that it was the fault of panel practitioners; on the other hand, the latter must be sure their conduct gave no ground for the allegations. There was undoubtedly a varying standard of incapacity in the minds of medical men, and Dr. Dain hoped the conference would agree that steps should be taken to review the certification of those whose standards were unduly low. It was impossible except at great cost to collect the certificates issued by a particular doctor, but the credit of the profession would be improved if machinery were available for ascertaining and dealing with exceptional cases. As a result of conversation between representatives of the I.A.C., the approved societies, and the Ministry, certain proposals had been made, and he was about to recommend them to the conference.

Dr. G. A. RORIE proposed an amendment by Dundee, "that the conference doubts the advisability of the I.A.C. taking any initiative in forming such proposals, but is willing to consider any suggestions made by the Minister." In support of this Dr. GORDON WARD urged that it was no part of the I.A.C.'s duties to pull chestnuts out of the fire for the Ministry. Approval of the proposals would be taken as admission of the need for tightening up certification, a need which most panel practitioners did not admit.—Dr. W. COOK also thought the charges of excessive certification were greatly exaggerated. He put down part of the increase of sickness claims to extensive epidemics of catarrh of the nose, throat, and tonsils, giving rise in their turn to an increase of rheumatism. Accidents due to motor vehicles accounted for a large number of claims, whilst the employment of women in industry caused a great deal of ill-health. Many of the men who had lost their livelihood in the coalfields were so short of food and clothing that their vitality was lowered, and it was quite proper to certify that some of them were unfit to perform their ordinary work.—Dr. B. E. A. BATT was willing and anxious to support the I.A.C. in any inquiry helping to prove that there was no excessive certification, but was not prepared to support proposals for a new disciplinary procedure.

Dr. DAIN replied that the profession was not asked to admit the facts: the facts were patent. Not in any particular district, area, or type of practice, but all over the country, there were a few doctors who were giving unnecessary certificates. The I.A.C. had taken no initiative, but had been asked to discuss with the Ministry on equal terms what should be done to prevent this from happening. For the most part the proposed changes could be set in motion by the Ministry, whether practitioners liked them or not, but he thought the profession ought to play a constructive part if possible.

This view was accepted by the conference, which defeated the Dundee amendment by a large majority and passed on to consider the I.A.C.'s recommendations in detail.

The Suggested Procedure.

The first of the new proposals is designed to prevent a patient from changing his doctor without the knowledge of his approved society, and lays it down that on "accepting an insured person on to his list during an illness which has rendered that person incapable of work," a practitioner shall issue a new first certificate. This principle was approved without much discussion.

The second recommendation is "that arrangements should be made for numbering certificate books, or certificates, or both, supplied to each practitioner, with the object of comparing the numbers of certificates issued by different practitioners within the same period." In commending this proposal, Dr. DAIN admitted that it did not go very far; different practitioners might have different uses for certification forms when they got them. Nevertheless over a period of, say, five years it might give a useful idea of the way in which certificates were being issued, and might show up any grave discrepancies. If there were two doctors practising side by side in the same area and one used three times as many forms as the other, there might then be a case for inquiry.—This proposal also was approved by a large majority.

The third motion ran as follows:—

> That records should be compiled of the references made to the regional medical officers, and of their results, in such a form as will enable comparisons to be made from time to time of the results of the references of patients of each practitioner and of the general body of practitioners whose patients are examined at the same examination centre.

Here again Dr. DAIN pointed out that the Ministry could carry out this proposal if it liked without reference to the wishes of the conference. At certain centres, in fact, the scheme had been working for some time, and experience showed that in each area there were two or three doctors whose referred patients were generally fit for work over long periods. Such a state of things seemed to be ground for further consideration, bearing in mind the nature of the particular practice, the general health of the area, and the percentage of aged people attended. The results of any comparisons would be communicated to the panel committees, and there was no suggestion that these matters should be laid before bodies with lay representation.—The motion was passed after it had been amended by addition of the words "always provided that no additional clerical work be imposed upon the panel doctor in this connexion."

Disciplinary Action in Cases of Excessive Certification.

The fourth resolution proposed by the I.A.C. led to a more brisk debate. In its final form it ran:—

> That a procedure should be established by which the number and nature of the certificates issued by a practitioner may, in suitable cases, be made the subject of: (a) an interview between the practitioner and a regional medical officer; (b) consideration and report by the Panel Committee; and (c) further action in any case in which it appears to the Panel Committee that the issue of certificates by the practitioner has been improper.

Dr. DAIN admitted that this was further disciplinary machinery and as such was objectionable. It must be remembered, however, that the need for such machinery was inherent in the system by which practitioners had a right to go on or off the panel as they wished. Any medical man could join the panel to-day, and this freedom was unwelcome to some of the approved

societies who were anxious to tighten up the machinery. The alternative was that the Ministry or the societies should choose their own doctors, or appoint only people working for them, and a proposal had even been made that special certifying doctors should be appointed under the Act. One of the penalties of going on or off the panel was that practitioners must submit to discipline and new machinery was essential if the present system was to be maintained. The new procedure was, of course, not intended to affect the present plan, by which complaints by approved societies about certification by a practitioner were referred for investigation by the medical service subcommittee, but it had the advantage that those who considered the case—i.e., the regional medical officer and the panel committee—would all be medical men. The committee would have the alternatives of recommending the Ministry: (*a*) that no case of lax certification had been made out; (*b*) that no action be taken for six months; (*c*) that a fine be inflicted; or (*d*) that the case should be investigated further by a committee of inquiry or should be referred to the General Medical Council.

Dr. S. A. WINSTANLEY proposed a Lancashire amendment to the effect that the existing machinery dealt adequately with any cases of irregular certification and instructing the I.A.C. to "resist the introduction of any further procedure, the result of which might be to harass those practitioners whose certificates do not approximately conform in number with the average in his or any other area." The insurance practitioner was accustomed, he said, to the Ministry's insistence that the practice of medicine and the treatment of disease must be reduced to a bare average, and it was now a recognised form of heresy to exceed that average. But avoidance of the heresy led the practitioner into the greater sin of false doctoring, and he feared that worse was to follow when not only treatment but also diagnosis and prognosis came under that law.

Dr. G. G. GINGE objected to the panel committee being placed in a punitive position, thus being turned from a friend into an enemy. What was wrong with the present regulations? He thought it unlikely that anything would prevent the Ministry from overriding the panel committee's decision and prosecuting in a medical service subcommittee.

Dr. DAIN refused to admit that insurance practice was governed by the law of averages, but he believed a man who did his work properly and gave what he thought necessary would probably find that his practice was surprisingly near the normal. If there was punitive work to be done he preferred that it should be done by a medical man.

The Lancashire amendment was lost by a large majority and the I.A.C.'s recommendation was approved on the understanding that new procedure would not come into force until after the next panel conference.

On a motion "that a single form should be introduced to replace the different forms now used to notify insured persons that they are referred to regional medical officers either (*a*) by approved societies or (*b*) by practitioners," Dr. DAIN said that at present there were two forms and the patient knew whether he was being referred by the society or by his doctor. The result was that the doctor rarely referred him, and the object of the resolution was to make it easier for the medical man to refer the patient without the latter's knowledge. The motion was carried.

Excessive Procedure: Signed Statements by Practitioners.

When excessive procedure is alleged there may be [illegible] between the regional medical officer and the practitioner concerned. Dr. DAIN said he had [illegible] as a consultant [illegible] to explain [illegible] to explain. The reason [illegible] differed in their [illegible] the Ministry [illegible] a report, [illegible] the Ministry must know whether it would be accepted by the practitioner. The latter was expected not only to make any corrections which seemed desirable, but also to amplify the statement as he thought fit, the object being to get the best explanations which he felt himself able to offer. On seeing such a statement the Minister would sometimes say that no further proceedings were necessary. This would be an advantage. On the other hand, once signed, the statement became a piece of evidence that would be produced at the panel committee's hearing. There were many members of the profession who would sign a statement about their own actions without a sufficient sense of responsibility; there were others without an appreciation of the meaning of words; and the scheme had the undoubted disadvantage that such people might make their position worse.

Dr. E. JOHNSTONE, for Manchester, proposed an amendment recommending that insurance practitioners be advised not to sign any statements of this kind. There were men in Manchester, he said, who would sign almost anything, and the whole business was designed to trip up the doctor.—Dr. J. D. WELLS held that the weaker brethren must be protected.—Dr. F. RADCLIFFE thought there was nothing to be gained by signing statements, as it did not matter how many cases went to the panel committees. It was a particularly unfortunate moment for the Ministry's suggestion to be made when the newspapers were full of accounts of similar inquiries designed to get statements out of a flustered defendant before prosecution.—Dr. H. S. BEADLES said that no two men would write the same account of a conversation, yet probably the practitioner would content himself with altering only a word or two here and there.

Dr. H. W. POOLER inquired what view the defence societies would take of these signed statements, to which Dr. H. B. BRACKENBURY replied that members of these societies could ask their advice before signature.—Dr. H. J. CARDALE objected to the suggestion that the intelligence of the profession was so low that medical men could not read statements, alter sentences, or get the opinion of a defence society or panel committee.—Dr. C. EDE thought the difficulty might be got over if statements were only signed on the advice of the member of the panel committee who attended the interview, but this suggestion was not accepted by the Manchester spokesman, who persisted in his amendment. It was lost by a considerable majority, Dr. DAIN having summed up in favour of the Ministry's proposals.

Dr. GORDON WARD, for Kent, proposed an amendment including the suggestion that the regional medical officer after the interview should "report only that the disciplinary procedure is or is not in his opinion necessary." Dr. Ward thought he should confine his attention to the question whether there was a *prima facie* case for investigation.—Dr. DAIN opposed this amendment because he thought it would be very dangerous to leave the decision in the sole hands of regional medical officers, whose outlook was very variable. In some areas every practitioner would be sent to the panel committee, in others none.—Dr. WARD replied that a decision by a known regional medical officer was preferable to a decision by an unknown official at the Ministry: the regional officer, moreover, would come in for censure if on the one hand he exceeded his duties or on the other hand failed to carry them out.

The view of the Insurance Acts Committee, that signed statements were desirable, was accepted by the conference.

Approval was also given to the following motion by Birkenhead:—

That panel committees be empowered to furnish, at best cost per annum, [illegible] after [illegible] to each practitioner on the local panel [illegible] panel committee [illegible] in the area [illegible] of a doctor in the area [illegible] [illegible] of the [illegible] of the [illegible] of the

Testing the Quantity and Quality of Drugs.

In 1926 the Panel Conference agreed that practitioners should furnish, if required, a prescription for the purpose of a test of the drugs and appliances supplied under the Insurance Act. On a paragraph on this subject in the I.A.C.'s report for 1927–28 Dr. L. J. PICTON, for Cheshire, suggested that a better scheme for testing drugs might be devised on the analogy of the system of inspection under the Food and Drugs Acts. It had been shown four years ago, he said, that two guineas was a minimal fee for the analysis of sample prescriptions, and to save money the Ministry had now adopted a system by which practitioners were asked to write fictitious prescriptions of simple mixtures in order that a large number could be analysed at the same time. He regarded this scheme as inefficient, for it often warned the chemist of what was intended, and he disapproved of medical men being forced to do work which was ethically distasteful to many of them.

Dr. E. LEWYS-LLOYD pointed out that analysts under the Food and Drugs Acts were asked to examine single substances, never mixtures. It would be quite impossible to examine insurance prescriptions on the same plan without great expenditure.

Dr. J. H. MARSH said that in signing these fictitious prescriptions under compulsion practitioners were helping to police the pharmacists. They were almost being turned into agents provocateurs, and he feared that with the extension of insurance benefits—e.g., to nursing—this principle also might be extended. Many drugs prescribed by panel practitioners came under the Food and Drugs Acts, and this ought to be a sufficient protection to patients.

Dr. DAIN said that the duty had been undertaken at the request of the chemists themselves, who had agreed with the Ministry that these were suitable steps to ensure that prescriptions were properly dispensed.

The Cheshire amendment was lost by a large majority.

The Nature of Medicine.

The I.A.C.'s report states that the Minister of Health holds that the question whether a particular substance is in a particular case a drug or a medicine within the meaning of the Act is generally one for legal decision. He is, however, prepared to issue some guidance about the means whereby an insurance committee can reach a decision on this subject, and the I.A.C. proposes to send to panel committees a list of preparations which in its opinion should ordinarily not be looked on as medicines.

Dr. A. FORBES, for Sheffield, moved that the I.A.C. be asked to reconsider its decision to issue such a list. In the first place, he said, there should not be a list at all; for the practitioner should be left to use his own judgment about what was necessary for his patient. In the second place there should not be the particular list which the committee had drafted; it contained the names, for instance, of various preparations containing vitamin A, which might be of great value.

Dr. DAIN said that if it could be agreed that certain substances were foods rather than medicine it would save the doctor possible expense and would be a guide to the chemist. He undertook that the list should be carefully scrutinised and that any specific objections would be considered.

The Sheffield proposal was vetoed by the conference, which proceeded, on the motion of Kent, to reaffirm its opinion "that the nature of financial arrangements now made with pharmacists is contrary to public policy." Dr. DAIN reported the progress that had been made with production of a National Formulary.

Change of Panel Doctor.

On a motion by Kent that "a fair trial of the 14 days' delay in change of doctor has shown it to be productive of hardships and difficulty without compensating advantages." Dr. DAIN urged that no opinion should be formed on this subject without further experience. In his own area the new system had reduced by about a quarter the number of patients who changed their doctor without changing their address. Some of the approved societies were pressing for a reversion to the 6-months or 12-months period, but the medical profession stood for the principle of the free choice of doctor.—The conference decided not to debate the subject further at present.

Misconduct of Agents of Approved Societies.

Dr. W. COOK said that whilst insured persons and the agents of approved societies could make complaints against practitioners, there were no means by which the latter, in his turn, could make complaints against them. In a case in Warwickshire reference to the Ministry had failed to stop an incriminated official from going on gaily with his work. He asked the conference to reaffirm its decision of 1926, that this small meed of elementary justice should be granted to insurance practitioners.

Dr. DAIN said the matter was not as simple as it sounded. The doctor could be brought before a medical service subcommittee because he was employed by an insurance committee, whereas the agents of approved societies were employed only by those societies. But the Ministry, by its new powers of withholding money for the administration of the societies, had gained a certain amount of power over their administrative machinery, and any complaint supported by evidence would certainly be dealt with.

Contract Rate for Juvenile Oddfellows.

Dr. J. NELSON, for Kingston-on-Hull, proposed that—

In the opinion of this conference the I.A.C. should not have given its approval to the recommendation of the Council of the British Medical Association to the Annual Representative meeting, that contract practice for juveniles should be accepted at a less rate than that obtaining under the National Health Insurance Acts, inasmuch as (*a*) it had not ascertained the views of the Panel Conference, representing all panel practitioners, and (*b*) the acceptance of such lower rate would be likely to have a prejudicial effect in any future negotiations that may take place regarding the capitation fee under the N.H.I. Acts.

He said that as the payment to be made for attendance upon juveniles did not come under the National Health Insurance Acts, it might be regarded as nothing to do with the Panel Conference. But if that was so, then the I.A.C. should not have expressed an opinion upon it. The question was one of principle. No form of contract practice should be accepted at anything lower than the National Health Insurance rate, and he believed that acceptance of the Manchester Oddfellows' offer of 8*s.* 8*d.* would prejudice the position when the question of a capitation fee for dependents came up for consideration. The profession had never accepted the 9*s.* capitation fee under the Acts as adequate, and when payment was again reviewed it would be regrettable if the I.A.C. should be able to say it had a mandate to accept 8*s.* 8*d.*

Dr. E. A. GREGG protested against the acceptance of the lower standard. In the London Medical Service, which had 10,000 members, the doctor received a clear 13*s.* for each patient.

Dr. J. W. BONE described the motion as a vote of censure. Did the conference think the I.A.C. should have refused to give its opinion on this matter of urgency? Everyone who had negotiated the present capitation rates was a member of the I.A.C., which was indisputably a committee of experts, and this Committee had agreed that the acceptance of 8*s.* 8*d.* would not be damaging in future negotiations and that, all things considered, it was the equivalent of the National Health Insurance fees. The incidence of illness was lower among children aged 3 to 16—or even from birth to 16—than it was amongst panel patients, who remained under treatment until they died. The London Medical Service was negligible in size, and the big medical services of the country did not on the average receive as much as 8*s.* 8*d.* In his own town the fee paid for juvenile Oddfellows was

5s. and the average for the country as a whole was between 6s. and 7s.

Dr. H. W. POOLER feared that the proposed rate would not be remunerative in a country practice where mileage had to be considered.—Dr. CARDALE thought the agreement would do great harm in future negotiations. A better position for individual practitioners in certain parts of the country should not be gained at the expense of the general interests of the profession. It would be an argument in favour of the proposal if children were really less trouble than adults, but he had always found his children's clubs particularly burdensome. Dr. JAMES HOLMES agreed that juvenile practice was harder than anything else, whilst Dr. A. BRADSHAW said that in Smethwick the local position had been made worse by the fact that the Council of the British Medical Association had approved the Oddfellows' offer.

Dr. BEADLES regarded 8s. 8d. as a considerable advance on what was being paid at the present time. —Dr. J. G. MCCUTCHEON believed that it was as much as could be got at present. In some parts of the country doctors were attending miners and their families at an inclusive rate of 15s. per annum, and work for juveniles was being done at 4s. 4d. Children might be more liable to disease than adults, but many now went to hospitals for infectious diseases, others came under the care of the public health and education authorities, whilst an immense number of babies went to child welfare centres.—Dr. R. FORBES also supported the I.A.C.'s action on the ground that it would raise the standard for the country as a whole, and Dr. BRACKENBURY said that if he had to conduct the negotiations for a capitation fee over again he would consider himself in a stronger position if a fee of 8s. 8d. had been obtained. He regarded it as comparable to 9s. under National Health Insurance or 13s. under a public service.

Dr. W. PALMER, supporting the motion for London, pointed out that no income limit was laid down for the family. The arrangements would be under the control of a friendly society and against a scheme of this kind the profession had always set its face.

Kingston-on-Hull's motion was ultimately carried by 69 votes to 50.

Miscellaneous Topics.

Among other subjects discussed was medical benefit for seamen, and it was agreed that the I.A.C. should continue its efforts to secure that the Seamen's National Insurance Society should be placed on the same basis with regard to medical benefit as other approved societies.

Swansea brought forward a resolution suggesting that a scheme should be formulated whereby pathological investigations might be undertaken where there were no existing facilities.—Dr. DAIN explained that there was no hope of carrying out such a scheme until after the next valuation. The question was, however, referred to the I.A.C.

Dr. E. K. LE FLEMING was unanimously reelected chairman for the coming year.

NEW TORBAY HOSPITAL.—This hospital will be opened at 2 [illegible] on Saturday, Nov. 17th, by Lord [illegible].

CHADWICK PUBLIC LECTURES.—Of the series of lectures [illegible] Chadwick Trust the next [illegible] Water Supply, will be given [illegible] on Monday, [illegible] Nov. 21st, at 5.15 p.m. [illegible] Society of Law, 11, Chancery-lane, W.C. [illegible] Following [illegible] Dr. R. [illegible] Dr. [illegible] Dr. [illegible] Dr

two or three years, results have been published which compare favourably with those obtained by the most experienced operators. Whether irradiation will replace the radical operation or no is still doubtful, but a more detailed account of the methods which have achieved success might have been included. The technique described in this book has proved ineffective as a curative measure in the past and the dosage represents a fraction of that considered to be essential by those with great experience in the use of radium for cancer of the cervix. The chapter on adenomyoma has been rewritten as the result of recent work on the nature of ovarian blood cysts. The pathology of the condition is explained as simply as possible and several excellent illustrations are supplied. Some of the recent work on the anatomy and physiology of menstruation is described, but discussion of such controversial subjects as the internal secretions of the ovary has wisely been avoided. Whatever may the importance of these substances in the gynæcology of the future, their value as therapeutic agents is at present practically unknown.

The section on operative gynæcology has been revised, particularly with regard to the treatment of fibroids and uterine displacements. There is a useful page of illustrations to show the methods of removing fibroids in different situations through a single anterior incision.

The edition is well produced and illustrated and will doubtless maintain the popularity of this standard work.

THE STRUGGLES OF MALE ADOLESCENCE.

By C. STANFORD READ, M.D. Lond., Lecturer in Psychological Medicine, Royal Bethlem Hospital; Medical Psychologist to the West End Hospital for Nervous Diseases. London: George Allen and Unwin. 1928. Pp. 247. 7s. 6d.

Dr. Stanford Read, whilst not claiming originality for this book, has used his own practical experiences to apply psycho-analytical principles to the study of the many unfavourable variations in the mental development of the male child. He admits a tendency to the direct inheritance of parental mental traits, but claims for modern psychology that with its help we can study and learn to avert maladjustments that have hitherto been too readily ascribed to heredity. The subject is adequately handled; in fact, the parent desirous of avoiding pitfalls, for whom the book is written, may become alarmed at the manifold ways in which he can come to grief in the training of his son. Dr. Read avoids one pitfall himself, skilfully enough, by offering little positive advice; he follows the safer plan of stating what errors are commonly committed, and his aim is so to educate and inform the parent that injurious influences may be eliminated, rather than to advise him in the direction of active interference The book may be recommended to medical men who desire an introduction to psycho-analytical views and their relation to the problem of adapting the child to social demands.

INDEX PSYCHOANALYTICUS, 1893–1926.

Compiled by JOHN RICKMAN, M.A., M.D., Hon. Sec., Institute of Psycho-analysis, London. London: Hogarth Press. 1928. Pp. 276. 18s.

IN the compilation of this Index Dr. Rickman has surveyed not only that literature, voluminous in itself, in which psycho-analytical principles are enunciated by recognised authorities, chiefly in the journals and library series devoted to psycho-analysis, but papers and books intended by the authors to be on psycho-analysis. He also provides references to many publications that have a bearing upon the subject, whether that is indicated by their titles or not. A search for isolated papers suggest that few English writers have escaped notice, whilst Continental and American publications seem to have been documented with equal care. Writings antagonistic to psycho-analysis have not been ignored, but the list of works of Alfred Adler ends at the year 1918, and familiarity with recent developments leads us to infer that Dr. Rickman considers his later writings to have no connexion with psycho-analysis. Since inclusion in the Index bears with it no stamp of approval, it is an advantage that references are given to reviews in the psycho-analytical journals. German, Austrian, and Hungarian contributions form the largest group, American and English are next in number; there is a small group of Swiss writers, but the Latin countries are scarcely represented at all. The names of over eleven hundred authors appear, and apart from its usefulness as a guide the book is a skeleton history of the development of this important subject. Our curiosity is stimulated by an isolated and untranslated sentence in Magyar at the end of the index.

POLIOMYELITIS.

By W. RUSSELL MACAUSLAND, M.D., Surgeon-in-Chief, Orthopædic Department, Carney Hospital, Boston. Philadelphia: Lea and Febiger. Pp. 402. $5·50.

IN this book the author has presented a general survey of poliomyelitis in its various aspects, with a more detailed account of the surgical treatment of its late results. In the earlier chapters, which deal with ætiology and epidemiology, and in the account of the general treatment of the acute stage, a comprehensive review is given of the publications of numerous authorities, the author maintaining an open mind on many of the questions under discussion. He gives a qualified support to the combined intravenous and intrathecal administration of human convalescent serum, though he recognises the doubt as to whether it ever comes into contact with the virus. The symptomatology and differential diagnosis of the acute stage are admirably described, and a clear idea is given of the assistance obtained from examination of the cerebro-spinal fluid at different stages of illness, and of its limitations.

The greater part of the book is devoted to the methods of avoiding deformities in the paralytic stage, and to the operative treatment of those which have occurred as residua. The text is profusely illustrated, and sufficient detail is given to enable the practitioner to deal with any combination of lesions which he is likely to meet. When discussing some of the general therapeutic measures used in the restoration of muscle power the author attributes little value to electrical stimulation, but is convinced of the efficacy of heliotherapy.

This book should be of considerable utility as an up-to-date summary of our knowledge of poliomyelitis, and as a book of reference.

ACUTE OTITIS AS A DISEASE OF CHILDHOOD.

Die akute Mittelohrentzündung. By Dr. ADOLF FR. HECHT, Privatdocent for Children's Diseases at the University of Vienna. Vienna: Julius Springer. 1928. Pp. 126. M.7·80.

THIS little book is not intended to give a description of inflammation of the middle ear from an otological standpoint, or to provide any account of the clinical aspect of this condition; it aims rather to discuss the incidence of the disease from an epidemiological point of view. A painstaking attempt has been made, with the assistance of numerous statistical tables, to show the frequency of otitis and its age and sex incidence in the various infectious fevers and in several other conditions such as tuberculosis, stomatitis, tonsillar and retro-pharyngeal abscess. Other tables show the stage of disease at which this complication occurs; thus the cases complicating measles are divided into four groups according to their incidence respectively in the prodromal stage, before the eruption, at the defervescence, and after

involution of the exanthem. Although the criticism may be made that the numbers of cases recorded are not sufficiently large to afford an adequate basis for drawing conclusions, the studies included in this book will be of interest to physicians, epidemiologists, and otologists.

HANDBOOK OF SANITARY LAW.

Tenth edition. By B. BURNETT HAM, M.D., D.P.H. London: H. K. Lewis and Co., Ltd. 1928. Pp. 284. 6s. 6d.

Dr. Burnett Ham's Handbook of Sanitary Law, mainly designed for the use of candidates for public health qualifications, has reached its tenth edition, and, as before, will be found a useful compendium. When the author first produced it in 1899 he commented on the frequency with which public health legislation had been amended. The law is now more confused than ever, and he does good service in calling for a consolidation of the various groups of statutes; it is an administrative scandal that health officers have to delve in the strata of the successive deposits of amendments under which the Public Health Act of 1875 lies buried. Dr. Ham's pages refer to the excellent consolidations of housing and town-planning law which were passed in 1925, but he does not appear to give Parliament credit for similar measures elsewhere. The consolidation of the Food and Drugs Acts took place too recently for his book to notice it; the law, of course, is correctly stated, but the statutes are now repealed and replaced. He might, however, have made it clear that the National Health Insurance and Workmen's Compensation Acts were similarly superseded in 1924 and 1925 respectively. It is a pity to print the 1913 classification of mental deficiency without a warning that it was changed in 1927, or to allude to Part II. of the Mining Industry Act (Pit Committees) which never took effect. In the chapter on the notification of infectious disease it might be noted that the 1919 Regulations (pneumonia, malaria, dysentery, trench fever, &c.) were superseded a year ago. These criticisms illustrate the difficulties of an author who tries to keep pace with the latest Parliamentary and departmental output. One source of help is the Chronological Index of the Statutes, an expensive annual publication issued by H.M. Stationery Office, wherein the latest changes affecting Acts of Parliament are officially recorded with such fidelity as human fallibility permits. Dr. Ham's handbook could hardly be expected to show every minor amendment and extension of the law. Within its own limits it contains a mass of information, and the candidate who masters it need fear no examiners.

EYE DISEASES IN GENERAL PRACTICE.

Die Behandlung der Augenkrankheiten in der Allgemeinpraxis. By Dr. KURT STEINDORFF. Leipzig: Georg Thieme. 1928. With 18 figures. Pp. 124. M. 5.80.

This little book is nothing if not practical. It deals with the treatment of those affections of the eye which are bound to come in the way of every practitioner, and leaves practically untouched all that is more wisely left to the ophthalmic specialist. The opening section discusses drugs, summarising well the relative advantages of cocaine and its substitutes, and dealing in the same way with atropine, eserin, adrenalin, and the silver salts and their substitutes. This is knowledge which every practitioner should possess, and the section is well up to date, even [illegible] Local anæsthesia is described; [illegible] applications of heat and cold to [illegible] and the specific treatment of [illegible] affections as well as non-[illegible] injuries of [illegible]. The second [illegible] to the treatment of [illegible] and [illegible] [illegible]

dealt with more summarily. Clear instruction is given as to the cases which the general practitioner cannot be expected to deal with except in consultation with a specialist; these include all operative cases, except minor operations, and all fundus diseases. As to refractive errors the general practitioner is counselled to undertake the correction of none but simple cases. It would be well, however, to emphasise more than is done in this book the danger of leaving untreated cases of squint in young children, for this is a matter with which the practitioner is pre-eminently concerned.

TONSILS AND ADENOIDS AND THEIR DISEASES.

By IRWIN MOORE, M.B., C.M. Edin., late Surgeon to the London Throat Hospital, and to the Hospital for Diseases of the Throat, Golden-square. London: William Heinemann, Ltd. 1928. Pp. 395. 21s.

Mr. Irwin Moore has here given us an interesting series of essays on affections of the faucial tonsils, with a chapter on the lingual tonsil and another on the nasopharyngeal tonsil or adenoids. Each chapter is followed by a copious bibliography, and the opinions of numerous authorities are quoted in the text, so copiously indeed in some places as to obscure Mr. Moore's own views. An interesting, though somewhat rare condition, bony and cartilaginous formations in the tonsils, is treated exhaustively, and with the wealth of reference to authority which have given such value to Mr. Moore's previous essays on obscure subjects in laryngology. Similar references are provided for other rare conditions, including uncommon varieties of benign tonsillar tumours. On the other hand, malignant disease of the tonsil is dealt with in a cursory manner: its treatment by operation, as well as by radium and X rays, is barely mentioned. The author is at his best in his detailed description of the methods of tonsillectomy by guillotine and by dissection, though his recommendation of a 4 per cent. solution of cocaine in 1 in 2000 adrenalin for injection to produce local anæsthesia must be considered a dangerous one, and we also take exception to his statement referring to general anæsthetics that the chief cause of death has been too light an anæsthesia, which allowed blood to be inspired. A full description is included of the treatment of enlarged tonsils by caustic soda and lime, introduced by Morell Mackenzie, and revived by Mr. Moore. He is surely overstating the position when he maintains that there is no after-pain with this method, but he is careful to note that this form of treatment cannot be expected to replace surgical removal in the ordinary run of cases. The book is not intended to be a systematic text-book on the tonsils, but is full of interesting matter, and is well illustrated.

BOOKS FOR NURSES.

Handbook on Venereal Diseases. For Nurses and others engaged in the Routine Treatment of these Diseases. By W. TURNER WARWICK, F.R.C.S., Assistant Surgeon and Medical Officer in Charge of Male Gonorrhœa Department, Middlesex Hospital. London: Faber and Gwyer, Ltd. 1928. Pp. 221. 6s.

A book on venereal diseases for nurses, midwives, and health visitors has been needed for some time. The modern technique in the treatment of venereal diseases is here dealt with very thoroughly, and if the book is to some degree over the head of all but the keenest nurses employed in V.D. clinics, it will be found most useful by medical students and general practitioners, as well as by clinic sisters. Mr. Turner Warwick provides in condensed form an excellent idea of the most modern treatment of the venereal diseases, and almost entirely avoids controversial and theoretical matter. His book will therefore please the practitioner who wants to keep abreast with the latest methods and not to be worried with [illegible]

The chapter on the duties of a nurse towards patients with venereal disease is really admirable.

A Text-book of Orthopædic Surgery for Nurses. By PHILIP LEWIN, M.D., F.A.C.S., Associate Professor of Orthopædic Surgery, Northwestern University Medical School, Chicago. London and Philadelphia: W. B. Saunders Company. 1928. Pp. 353. 15*s.*

WE are not sure that the need for special text-books on surgery for the use of nurses has been proved to exist, but granted that there is such a want, Prof. Lewin is well fitted to supply it. Any nurse who wishes to go beyond her own work, and to enter into the problems of diagnosis and the choice of methods of treatment in orthopædic cases, might be better advised to consult the larger text-books, where she would find adequate descriptions of some conditions which are barely mentioned in this book. The brief chapters in Prof. Lewin's book which more nearly concern nurses, such as that on the use of plaster-of-Paris, will be found of great practical value.

GOOD HEALTH, GOOD PARENTHOOD, GOOD COOKING.

How to Enjoy Health: Counsels and Maxims for the Healthy Life. By CLAUDE LILLINGSTON, M.D., Editor of the *World's Health;* and NORAH HILL, A.R.R.C., Assistant Editor. With Preface by Sir SQUIRE SPRIGGE, M.D., Editor of THE LANCET. London: Hodder and Stoughton. 1928. Pp. 287. 2*s.* 6*d.*

On Being a Father. By K. M. and E. M. WALKER. With an Introduction by CECIL DELISLE BURNS. Illustrated by VIOLET M. GUY. London: Jonathan Cape. 1928. Pp. 192. 5*s.*

Prudence and Peter: A Story for Children about Cooking Out-of-doors and Indoors. By ELIZABETH ROBINS and OCTAVIA WILBERFORCE, M.R.C.S., L.R.C.P. London: Ernest Benn, Ltd. 1928. Pp. 208. 7*s.* 6*d.*

THREE books which have reached us within the last month have as a very high common factor the circumstance that they are each the product of a doctor writing in collaboration with a laywoman. The unusual quality of all three may be mere coincidence, but it induces a reflection that in this joint authorship may perhaps lie the secret of preparing popular books on general and special hygiene, infection and disinfection, the biochemistry of the kitchen, the phenomena of fertilisation and childbirth—in fact on all those subjects associated with the body and its functions on which the public is greedy for clear and accurate information.

It is stated in the author's preface to one of them that Dr. Lillingston has verified Miss Hill's facts, while she has curbed any tendency on his part to indulge in technicalities and scientific jargon. The result is a mixed bag of stimulating essays on subjects ranging from fleas to drug addiction, from constipation to maternal mortality, from the treatment of persons found unconscious to the choice of a career. None of the essays contains more than about 1500 words, most of them considerably less. There is not a redundant word throughout the book, but in spite of being pithy the essays are whimsical, easy to read, and full of grace. The authors review with light touch many of the problems which have been the subject of serious debate in scientific circles during the last few years. Their work is entirely free from those dogmatic assertions which irritate the informed, and yet the reader is led to a definite point of view. If, as is implied, these notes are reprinted from articles on health and preventive medicine contributed to different Red Cross journals, we must urge the authors to continue writing them and to collect and publish further evidence of their flair for interesting the layman in the preservation of his health. If it is not ungrateful to criticise such an admirable production, we may express doubt whether a modern alienist would agree that the hysteric and the neurasthenic are true borderline cases; at any rate, the fate of untreated sufferers from the neuroses is not sufficiently established to make it desirable to say much about it in a handbook which may be read by many whose nervous condition is unstable.

Mr. and Mrs. Kenneth Walker have divided their book into two parts, of which the former instructs the expectant father as to the facts known about fertilisation, heredity, fertility, birth control, pregnancy, and childbirth. In the first chapter, on animal fathers, the authors contrast the happy-go-lucky habits of most insects, where the fathers take parental responsibilities lightly, with those of bees, wasps, and ants, whose young are cared for on methodical lines well in keeping with the rest of their well-ordered lives. Notes on fatherhood among reptiles, birds, and mammals lead up to a sympathetic review of the paternal instinct, its development and its limitations. Succeeding chapters deal with subjects which have only recently become drawing-room topics, and may again be banished in a less outspoken age. Mr. and Mrs. Walker handle them with such a delicate touch that no one could fairly criticise either their matter or their taste. The question posed by Mr. A. P. Herbert—"What do the ladies talk about when the ladies leave the table?"—reminds us that during this century the white slave traffic, venereal disease, psycho-analysis, birth control, and homosexuality have succeeded one another as fascinating mysteries whose attractions varied inversely with the ignorance of the conversers. It is informative books like the one under review, written with a fine sense of values, which relieve the processes and problems of reproduction and the phenomena of sex of a murky significance, and establish knowledge of them as part of the philosophy which every adult has to acquire. When such problems are considered seriously in a scientific treatise quite without affective tone, the average reader will find them dull and will prefer to live in a world of piquant guesses. If they are treated with sickly emotion, as in so many popular works, the more educated layman is merely disgusted by the sentimentality. Mr. and Mrs. Walker have a sense of the grave responsibilities of fatherhood, actual and potential, tempered with the gay conviction of happy parents that life and its transmission can be and should be good fun. The second part of the book gives directly practical advice to established rather than expectant fathers, consisting of wise hints on companionship, the growth of fear, early training, the swing of the pendulum against stern disciplinary methods, and story-telling. The illustrations are delightful.

Prudence and Peter have a simpler mission. They are twins of 12 who have a taste for good food as well as for adventure. They make friends with the family cook, an artist who exacts stern discipline from her pupils, but in return for serious attention gives of her best; and her best is a collection of recipes (set out in an appendix), and a continuous flow of practical advice on the theory and practice of the preparation of foodstuffs. Not that her dishes are elaborate; the scene is laid in a country house in war time, and the climax is a dinner for a General home from the front, cooked by the twins under the watchful eye of Mrs. Barber, whose sprained ankle has forced her into a passive rôle. There is no limit to the appeal this book should make, or to the age, sex, or social position of those who would welcome it as a Christmas present. We have tried some of the original recipes and found them good. The most delicious (and the only extravagant one in the book) is *crème brûlée.* It is also the most difficult to bring off, and for the less skilled the addition of another egg and the substitution of more cream for milk is advisable. The name of Miss Elizabeth Robins as joint author with Dr. Wilberforce is sufficient indication that the technique whereby instruction is woven into the charming sketch of family life is a joy in itself.

THE LANCET.

LONDON: SATURDAY, NOVEMBER 3, 1928.

THE PANEL PRACTITIONER'S DUTY.

THE last few years have seen an alarming increase of claims for sick-pay under the National Health Insurance Acts, and as every claim hangs on a medical certificate the first impulse of all concerned has been to lay the whole blame on the doctor who has to sign it. We trust that this impulse, after two years' vigorous expression, has now worked itself out leaving minds ready to think of causes other than the carelessness, self-seeking, or sentimental pliability of our profession. Dr. DAIN told the Panel Conference last week that leading officials of approved societies have agreed to speak more temperately than has been their custom of late, whilst the Ministry of Health long ago ceased to look on faulty certification as the principal cause of this drainage on insurance funds. No one can really believe that the profession has suddenly changed its standards or lost its feeling of responsibility. As things stand the temptation to be complaisant is certainly very present to many a panel practitioner, but we have a right to assume that the other explanations of the rise in sickness-rates will not be overlooked. Times have been hard, and industrial upheavals have impaired the livelihood of hundreds of thousands of working men. Malnutrition of body and mind has lighted up the ailments of many who would take work if they could get it; moreover, the average age of insured persons is rising, and they are more and more aware of the benefits due in return for payment under the Acts. It may be true that there have lately been no widespread epidemics, nor any general rise of morbidity, but an increase has been noted not only in the sickness claims on National Health Insurance funds but also in claims on insurance societies and companies whose members come from a wealthier stratum of the community. Lastly, as the Insurance Acts Committee suggests, there may have been some mistake in the original calculation of the amount of sickness and disablement benefit that would be needed. The three quinquennial periods since the Act came into force have been covered by the war, the boom that followed it, and the subsequent depression, and "it is a little difficult," as the Committee remarks, "to understand how a normal standard as regards the amount of sickness and disablement has been arrived at."

When all this has been said, the painful facts remain to be faced. It is a delusion to suppose that the funds of the approved societies, because they are large, are inexhaustible. They have no supernatural inlet, like the widow's cruse or the drinking-cup of Thor, and on close examination the balance of £42,000,000 at the last valuation justifies no more than a slight extension of the scope of national insurance. Rightly enough, Sir ALFRED WATSON and his colleagues have agreed that only £27,000,000 of the surplus shall be distributed during the present five years, and over £18,000,000 of this will be absorbed in additions to the statutory money benefit. That leaves less than £9,000,000 for additional benefit in other forms, or something like 3*s.* 7*d.* a year for each insured person. Clearly this does not go very far towards setting up the specialist and hospital services that ought to be developed from the Acts. Far from being inexhaustible, the funds are little more than sufficient for the elemental needs of the huge population they serve, and the distribution, during one year, of a week's extra benefit to every person on the sick-roll would mean the abandonment of a specialist service and the collapse of the scheme for additional benefits. In reporting that there was a reasonable expectation of these benefits continuing, Sir ALFRED said that they would only do so if a high standard of administration was maintained by the approved societies, if there were no unfavourable visitations such as the industrial crisis of 1925–26, and if the full coöperation of the medical profession with regard to sickness claims could be ensured.

The National Health Insurance funds may be likened to the water in a cistern which supplies a thirsty population of 13,500,000. At present the cistern is fairly full, but the people outside are demanding more and more drinks. One way of dealing with the situation is to educate them to a sense of responsibility, to make it clear that there is only a certain amount of water, and that if they do not use it carefully there may not be enough later on. In an ideal community this caution would be sufficient, but here in England it is essential to see that water is strictly withheld from those who do not need it. Panel practitioners are in the unenviable position of being the taps through which it is distributed, and there is not the least doubt that a few of these taps work much too easily so that there is always a crowd round them to profit by the flow of sickness certificates. The system is faulty because the practitioner is paid according to the size of the crowd he collects, and because the patient moves off to another tap if he encounters any stiffness or opposition. The first fault, which is inherent in the whole scheme of panel practice, is largely neutralised by the traditions of the profession; the second has been limited to a certain extent by the new plan under which a patient cannot change his doctor without a fortnight's notice. The principle of free choice of medical advice is very important and should be kept as far as possible, though the wisdom of the choice must ultimately depend upon the enlightenment of the insured population. This enlightenment is growing and though the panel practitioner may be conscious of opposition between his interests and his duty, we believe that a correct attitude will pay him in the long run. To maintain such an attitude can never be very easy, even for the most altruistic, since he is called upon to hold a delicate balance between the welfare of his patients and that of the community. Therefore there will always be individual differences in practice and the authorities would be unwise to insist on bare invariable averages. On the other hand, it is regrettable that the failure of a few individuals to make reasonable efforts should prejudice the position of the profession, and we believe that practitioners in general will welcome the new arrangements for ascertaining and checking excessive certification, as approved by the Panel Conference. They are set out in our report on p. 920, and here we need only mention the inconspicuous fact that the conference also arranged better facilities for referring a troublesome patient to a regional medical officer. Some extension of the

disciplinary machinery of the Acts is unfortunately foreshadowed in the proposals, but as Dr. DAIN pointed out, this machinery is the price paid by the profession in return for freedom to go on and off the panel at will. Some of the alternatives advocated, such as the appointment of special certifying doctors, or the direct employment of practitioners by approved societies or by the Ministry, would be even more objectionable. The present system is so nearly ideal in so many ways that it is well worth preserving, and in considering the differing views and suggestions of those who would like to change it, we feel that panel practitioners should congratulate themselves on being represented by such men as Dr. DAIN and his colleagues. If the service is to develop usefully it can only be by the labours of those who combine clear sight with a strong sense of the responsibilities of the profession.

THE CHARACTERISTICS OF HYPOCHONDRIA.

ONE use of the classification of diseases is to put our own conceptions into ordered form and to compel attention to the significance of words that, without an occasional survey of our ideas, may come to possess very different meanings for different people. Hypochondria belongs to the name-group that includes melancholia and hysteria and it has survived in our terminology perhaps because, by the divorce between etymological meaning and clinical application, it has lent itself to the expression of views that, by the nature of the subject, could not easily be expressed in a word of definite diagnostic or symptomatic significance. This has, however, resulted in such a loose use of the word and its derivatives that clarification has become necessary. Hypochondria has been confused with hysteria and neurasthenia; a patient who is "sorry for himself" is called hypochondriacal, whilst at the other extreme we find that psychiatrists recognise a hypochondriacal melancholia or even paranoia. Thanks to modern psychopathology, our conception of hysteria is becoming more definite than it was, and from neurasthenia have been separated the anxiety and obsessional states, which are capable of clinical differentiation and differ from each other in their pathology and readiness of cure, a small group of cases of unified type being all that is left to which the term neurasthenia may be usefully applied. The time has obviously come for a consideration of the position of hypochondria, and Dr. R. D. GILLESPIE opened a discussion on that subject on Oct. 23rd at the Royal Society of Medicine, as reported in our last issue. He took up the position, not unknown in general medicine, that although in mental disorders there are no diseases, only diseased people, yet it is convenient and useful to put cases into groups so that we can easily sum up our ideas regarding such matters as ætiology, treatment, and prognosis. Recent work as Pinsent-Darwin research student at Cambridge University leads him to believe that there is a type of case, admittedly rare, in which exists a symptom-complex with well-defined characters and that this type of case can be classified as hypochondria. The patient shows a persistent preoccupation concerning bodily health in excess of what would be justified by any physical disturbance that happens to be present, with an emotional attitude best described as interest with conviction, anxiety (in the sense of a fearful apprehension of disease) being absent. The absence of anxiety is, it may be deduced, an important diagnostic criterion and should exclude those cases in which a continued emotional state produces visceral disturbances upon which the attention of the patient and others may be wrongly fixed; cardiac and digestive troubles of this nature are to be recognised by the concomitant symptoms of pathological anxiety, which exclude them from Dr. GILLESPIE's category. He excluded visceroptosis with a mental fixation upon abdominal symptoms, and it may be noted that some psychopathologists believe that visceroptosis itself may be the result of a continued asthenic emotional state. Hypochondria he places upon the intellectual rather than the emotional level, the only emotion being that attached to certainty of belief. It differs essentially from hysteria in that it serves no secondary purpose; the hypochondriac does not use his disease to influence his environment, and except for his insistence upon treatment and upon operations it interferes little with happiness. One speaker, indeed, frankly advised letting the patient alone in his happy preoccupations. Dr. GILLESPIE agreed with FREUD's observation that the hypochondriac shows the character traits of orderliness, parsimony, and obstinacy, and noted that the absence of psycho-analytical views about ætiology was due to the inaccessibility of the patient to analytical procedure. This inaccessibility, which is related to an insusceptibility to the influence of reassurance, marks off the condition from the psychoneuroses, which are called transference neuroses by FREUD because of the ease in setting up that relationship with physician or analyst which permits of suggestive influence or analytical therapy. There seems to be a deep alteration of personality which implies a relationship with the major psychoses, an implication strengthened by the occurrence of hypochondria as an early symptom in dementia præcox, although it is characteristic of typical hypochondria that it is not accompanied by intellectual or emotional deterioration. The characteristics of this form of mental disorder seem to preclude satisfactory treatment when once gross organic disease has been proved absent; the best we can do for the patient is to save him from quacks and protect him from his own insistence upon operations; but in spite of—indeed, because of—this unsatisfactory conclusion, it is the more necessary that recognition of the disorder should be made certain and that our conception of it should be made clear. The paper and subsequent discussion have greatly helped in that direction.

PUBLIC HEALTH AND LOCAL GOVERNMENT.

THE Second Report of the Royal Commission on Local Government [1] covers, amongst other matters, two principles discussed in our columns last week in connexion with Sir GEORGE NEWMAN's annual review of the state of public health—namely, the organisation of local government in larger units, and the concentration of all health services in one administrative unit in each area. Some of the figures submitted to the Commission by the Ministry of Health were striking. Last year there were 66 boroughs, 302 urban districts, and 126 rural districts with a population of 5000 or less; in the large majority of these a penny rate produces less than £100. It is no reflection upon the zeal and capacity of the members and officials of these bodies to say that their standards of public health service must suffer if their financial resources are so limited. Nobody desires to strike a blow at an institution so national and characteristic as local self-government in England, nor to sap the confidence of the ratepayers in their elected representatives;

[1] Cmd. 3213. H.M. Stationery Office. 1s. 6d.

but a too parochial organisation is unsuited to modern conditions. In the provision of isolation hospitals, for example, there is undoubtedly a shortage of accommodation which may not unfairly be called a public danger; many county districts are admittedly quite unsuited either in respect of population or finance to provide and maintain their own hospital; much has been done by joint action, but the progress in this direction is merely a proof that the local government unit for this purpose is too small.

The present system of allocating health functions between the various local authorities can in certain instances be criticised as arbitrary, illogical, and uneconomic, though any plan for redistributing those functions must be careful not to disparage the work and irritate the temper of the members of local bodies who have given their services with so much public spirit in the past. The Notification of Births Acts may be selected as one such instance. These statutes do not merely exist for the compilation of statistics; they should ensure that the occurrence of a birth attracts the attention of the local authority responsible for maternity and child welfare arrangements. Yet there are areas where the working of the Notification of Births Acts is in the hands of local bodies which are not the bodies responsible for maternity and child welfare. The urban district council may be the authority for school medical service and maternity and child welfare work, while the county council is the "local supervising authority" under the Midwives Acts. Up to the birth of the child, therefore, the urban district council is entrusted with the welfare of the mother and the unborn child. At birth the midwife takes charge and the responsibility for supervision passes to the county council for a brief period. Eventually the urban district council resumes control in its capacity of school medical authority, but meanwhile there has been a break in the continuity of supervision. County councils, and not district councils, are, in the great majority of county districts, the local authority for the purposes of the Midwives Acts and for maternity and child welfare. Yet the Public Health (Ophthalmia Neonatorum) Regulations direct the attendant practitioner to notify first the medical officer of health for the county district wherein the case has occurred; the county medical officer is merely entitled to a copy of the notice within the next 24 hours.

The reshuffling of functions is naturally no easy matter. It would, for example, be dangerous to tamper with existing arrangements for school medical services because it would mean reopening questions of responsibility for elementary education which were none too easily settled in 1902. The Royal Commission's recommendations are sensible and discreet. It proposes that the 1902 arrangement be left undisturbed: that school medical authorities not now responsible for maternity and child welfare work should be empowered to represent to the Minister of Health that they should undertake that responsibility; and that county councils should be empowered to represent to the Minister that maternity and child welfare authorities which are not local education authorities should hand over their maternity and child welfare work to the local education authority. This transfer, it is recommended, should be made possible by an order of the Minister. As regards the Notification of Births Acts it is recommended that the authority responsible for working those Acts should be obliged to send forthwith a duplicate notification to the local maternity and child welfare authority. Here the Minister had suggested that the same authority should exercise both functions, but the Royal Commission hesitates to go quite so far. Its proposals as to the Midwives Acts are as follows: the maternity and child welfare authorities, if they employ a whole-time medical officer, should be empowered to represent to the Minister that they should be constituted "local supervising authorities" under those Acts; before he makes an order to that effect, the Minister, it is suggested, should have regard to the size, equipment, and resources (including the provision for training midwives) of the applicant unit; county councils, it is further proposed, should be empowered to represent to the Minister at any time that on administrative grounds the duties of a local supervising authority under the Midwives Acts should be retransferred to themselves. As to the ascertainment and treatment of ophthalmia neonatorum it is recommended that the responsibility be assigned to a single authority in each area—namely, the authority for maternity and child welfare; and it is proposed that notifications should go in the first instance to the local authority which gives the treatment, whether or not it is also the "local supervising authority." The report shows an appreciation throughout of the need of the power to stimulate a backward authority and to deal with default. The county council, it is suggested, should have the duty of seeing that adequate provision exists for isolation hospitals in the county; it should draw up a scheme in conference with all local authorities concerned, and, if it is satisfied that provision in any area is inadequate or ill-arranged, it is to frame proposals for reorganisation or rearrangement subject to a right of appeal by a local authority to the Minister. Small-pox hospitals are apparently regarded as capable of differentiation from other infectious diseases hospitals. The Commission recommends that the task of providing and maintaining them be given to the county councils, but that existing arrangements, where satisfactory, should not be disturbed.

From these recommendations it will be seen that the Royal Commission generally favours elasticity rather than rigidity. The countryside will have some say in the rearrangement of its local government; it is not to be the victim of a Parliamentary Procrustes. Other matters worth study will be found in the Second Report—proposals, for instance, for large-scale water-supply and sewerage where there is a common interest in such services. One final point may be mentioned in conclusion, a point already raised in Sir GEORGE NEWMAN'S recent summary. The Royal Commission definitely approves, wherever possible, the appointment of whole-time medical officers of health, and the progressive acceleration of such appointments whenever individual vacancies occur. They recommend that every county council, in consultation with the county district councils, should frame a scheme of whole-time appointments for the county, statutory provision being made for this purpose. As vacancies occur in part-time posts in county districts, the district council should appoint a medical officer either solely or jointly with the county council or other local authorities on terms which preclude the medical officer from engaging in private practice. The Royal Commission adds that in special circumstances the Minister of Health should be empowered to waive this requirement on a representation from the county council or other local bodies interested. But the report stipulates that such an exception should only be made if the Minister thinks insistence on a whole-time appointment is "for the time being" unreasonable. We are evidently approaching the moment when the requirement will be universal.

Annotations.

"Ne quid nimis."

TUBERCULIN TESTING OF CATTLE.

WITH the assistance of the Medical Research Council as a coördinating centre the tuberculin test is attaining great accuracy and precision in the diagnosis of bovine tuberculosis. Two reports have been issued by the Tuberculin Committee of the Council, which has now been at work for eight years. In the former of these,[1] dated 1925, the Committee found the subcutaneous test to be satisfactory enough under laboratory conditions, but subject on the farm to many fallacies and defects of interpretation. They were concerned therefore to introduce a modification of the intradermal test which would be suitable for ordinary field work. This has now been done and the double intradermal test, as it is called, is the subject of the report[2] before us, the technique being described in detail in an appendix. The report is based upon the experience of 77 veterinary surgeons who replied to a questionaire, drawn up by Prof. Buxton and Dr. MacNalty, which comprised 11 questions designed to elicit not only the surgeon's experience of the test but also his views on the problems and difficulties arising in the conduct of the test. The replies admit of compact summary, for it appears that the new method is being increasingly used and approved by veterinary surgeons throughout the country for the testing of graded herds; its trustworthiness has been amply confirmed by the results of post-mortem examination. Put in a few words, the double intradermal test is simple, clean, and easily performed under farm conditions, its technique is easily acquired, it saves the time of surgeon and stock-owner, it does not disturb farm routine, it has little or no effect upon milk yield, and it may be applied without risk to pregnant cows and to very young animals. One surgeon describes it as a real godsend to the single-handed country practitioner. It is true that a certain percentage of doubtful reactions have occurred, the proportion varying widely in individual practice, but the Committee explain these doubtful reactions as due on the one hand to concentration on local reaction to the exclusion of such clinical factors as pain, heat, and tenderness, and on the other to the well-known insensitiveness to tuberculin of animals with chronic advanced tuberculosis. The former difficulty is to be surmounted by acquiring a sense of proportion, the latter by finding gross signs of tuberculosis on physical examination. In the small percentage of cases which may still appear doubtful, the proposal is to retest by the double intradermal method using sterile broth as a control. It may prove possible to render the test more conclusive by increasing the strength of tuberculin employed, this to be done without increasing the bulk of the present dose (0·1 c.cm.). One great advantage of the experience gained is the elimination of other tuberculin tests; the ophthalmic test is now regarded as untrustworthy, and other subsidiary tests are left to the discretion of the veterinary surgeon. And, finally, the intradermal test is comparatively little influenced by the previous application of other methods of testing, which is as much as to say that the practice of "doping" or "faking" a suspected cow with tuberculin before submission to the veterinary surgeon will now be futile. Apart from its application to veterinary medicine the work of Prof. Buxton and Dr. MacNalty will most certainly react on the use of tuberculin in human practice where a higher standard of scientific precision is equally to be desired.

[1] See THE LANCET, 1925, i., 831.

[2] The Intradermal Tuberculin Test in Cattle. By J. Basil Buxton and A. Salusbury MacNalty. Medical Research Council, Special Report Series No. 122. H.M. Stationery Office. 1928. Pp. 64. 1s. 6d.

THE DEATH CERTIFICATE.

WHEN the law of death certification was altered two years ago, the changes failed to satisfy those reformers who wanted something more than half a loaf. Their criticisms of the present system, with its serious risk of premature burial and the non-detection of crime, did but repeat what had already been said by a Select Committee of the House of Commons in 1893 and by a Departmental Committee in 1910. A vigorous pamphlet by Sir George Greenwood,[1] whose death occurred suddenly last week, now sums up these criticisms afresh. He cites an answer given by the Minister of Health in the House of Commons in 1923 to the effect that in the previous five years 31,332 deaths had been uncertified in England and Wales; he mentions the recent estimate of a London coroner that some 5000 people are buried every week in England and Wales whose death certificates have been given without the body being seen by the certifying doctor; and he recalls the saying of Dr. Richardson some 40 years ago that he did not know one medical man of extensive practice who, in the course of it, had not met with a case of secret murder. What the reformers wanted, of course, in 1926 was not the Government's Births and Deaths Registration Bill (which was passed into law at the end of that year), but the Bill framed by the Special Committee of the Federation of Medical and Allied Services. The latter Bill proposed to enact that a medical certificate of the fact of every death or still-birth must be given by a registered medical practitioner who has viewed and examined the dead body and is satisfied that life is extinct. The most audible objection to this proposal was the difficulty of finding the money for the doctor's fee. The relatives would not object, replied the reformers, if the fee for this post-mortem visit were made recoverable like the fees for visits during the patient's life-time; the cases of poor people could be met by a simple extension of the panel system or the poor-law rules. The reformers, however, were defeated; some of the medical members of the House of Commons transferred their support to the Government's Bill, and Sir Kingsley Wood declared that a complete medical examination in every case, as the reformers desired, "would mean very considerable expense and would set up a universal and compulsory requirement for a very small chance indeed." A much less drastic change was made. The form of medical certificate of the cause of death now shows the date when the certifying doctor last saw the deceased alive, and further shows whether or not he saw the deceased after death. Regulations under the Act of 1926 require that the registrar shall report to the coroner inter alia any case where the deceased was not attended by a registered medical practitioner during his last illness and also any case where it appears that the deceased was seen by the certifying doctor neither after death nor within 14 days before death.

Sir George Greenwood's lively pen attacks the Minister of Health, the Registrar-General, and all bureaucrats in Government offices because the law does not go far enough and because its provisions are to be sought in a multiplicity of statutes and statutory rules and orders. Legislation in advance of public opinion is unlikely, and, unless some sensational case occurs, the education of public opinion is a slow process. The Acts are certainly in a dismal tangle, but the new code of statutory regulations, long as it is, is a vast improvement on its predecessors. As a former member of the House of Commons Sir George Greenwood will know that Parliament no longer seems willing to find time to legislate directly upon such matters as that code contains. To that extent his allegation of bureaucracy comes too late in the day. Indeed, the public may see a less offensive bureaucracy in the present system than in the proposed intrusion into their homes of the doctor

[1] The Law of Death Certification. By Sir George Greenwood. Humphrey Milford, Oxford University Press. 1928. 2s. 6d.

who comes to pay his compulsory post-mortem visit. The reformers have to persuade the public of the necessity for the reforms; for this purpose Sir George Greenwood's pamphlet is well conceived and timely, and it is sad that he is no longer here to press the arguments home.

PROPHYLACTIC INOCULATION OF ADULTS WITH B.C.G.

HITHERTO Calmette's living B.C.G. vaccine has been used almost exclusively for the protection of newborn infants in tuberculous surroundings. The vaccine has been given by the mouth to these infants, and Calmette has taught that the permeability of the gastro-intestinal tract to his vaccine is more or less peculiar to the newborn, and that it diminishes greatly, or ceases, soon after birth. In a paper published in *Tidsskrift for den Norske Laegeforening* for Oct. 15th, Dr. J. Heimbeck, of the Ullevaal Communal Hospital in Oslo, to whose work on tuberculosis in nurses we referred not long ago,[1] publishes observations in support of B.C.G. inoculation of young Pirquet-negative adults. Since May, 1926, he has given this vaccine by subcutaneous injection to 726 Pirquet-negative persons under the age of 30. The dose of 0·2 mg. was found to provoke abscesses and sinuses in many cases, and was therefore reduced to 0·05 and, in some cases, to 0·03 or 0·02. He was able to keep under personal observation as many as 322 patients, and in no case did symptoms of general illness, or permanent sequelæ, develop. In 53 cases abscesses formed; they lasted for a week to five months, but cleared up quickly when treated with sunlight or quartz-lamp light. Inoculation of guinea-pigs with the pus in eight of these cases never provoked tuberculosis. In 114 cases an infiltration formed at the site of the infection, persisting for a year or more and attaining a maximum dimension of a pea, but causing no tenderness. In 294 of the 322 controlled cases, the Pirquet reaction changed from negative to positive, and in no case did a repetition of the test show that the reaction had again become negative. Of special value in estimating the importance of this procedure were the observations made on the nursing staff of the hospital. The nurses were classified according to the years in which they joined the hospital, to their reaction to the Pirquet test, and to their treatment, or lack of treatment, with B.C.G. Of the 1924 class, who were Pirquet-negative, eight had developed tuberculosis by August 31st, 1925. Of the 1925 class, who were Pirquet-negative, 18 developed tuberculosis during a similar interval, and this was the fate of 14 of the Pirquet-negative nurses of the 1926 class. In other words, 16 per cent. of these Pirquet-negative nurses developed tuberculosis soon after coming in contact with tuberculous patients. Altogether 89 Pirquet-negative nurses were inoculated, 5 in October, 1926, 44 in 1927, and 40 in 1928. The nurses inoculated in 1926 had already been in contact with tuberculous patients for three or four months when they were inoculated. All the other nurses were inoculated as soon as they were found to be Pirquet-negative, and before they were set to work with tuberculous patients. Two of these 89 subsequently developed signs indicative of tuberculosis—pleurisy in both cases; but one of them belonged to the 1926 class, which had been exposed to infection for some months previous to the inoculation, and the other developed pleurisy only a month after the inoculation—i.e., at a stage when there had not been time to gain immunity. In the 1927 class there were 12 Pirquet-negative nurses who refused to be inoculated, and five of them subsequently developed tuberculosis. In the 1928 class there were 18 Pirquet-negative nurses who were not inoculated, and three of them have since developed tuberculosis, whereas of the 40 Pirquet-negative nurses of the 1928 class who were inoculated, only one fell ill—the case of pleurisy already referred to. Thus, for the 1927 and 1928 classes, the tuberculosis morbidity among the 84 inoculated Pirquet-negative nurses was only 1·2 per cent., whereas it was 27 per cent. among the 30 Pirquet-negative nurses who were not inoculated. It is safe to predict that Dr. Heimbeck's extension of Prof. Calmette's preventive inoculation to include Pirquet-negative persons irrespective of their ages will arouse the greatest interest everywhere, and will lead to a repetition of his experiments on a large scale.

[1] THE LANCET, 1927, ii., 290.

HEALTH OF THE NAVY.

THE arresting feature of the Statistical Report on the Health of the Navy for 1926[1] is the general reduction reported in tuberculosis. Pulmonary tubercle accounted for 187 cases, 174 invalidings and 13 deaths, compared with 221 cases, 197 invalidings and 31 deaths in the previous year, the rates per 1000 being 2·06 cases, 1·91 invalidings, and 0·14 deaths, as against corresponding rates of 2·45, 2·19, and 0·31 in 1925. Of non-pulmonary tubercle there were 24 cases, with 21 invalidings and 1 death, compared with 28 cases, 27 invalidings, and 6 deaths in the previous year, the rates per 1000 being 0·26 cases, 0·23 invalidings, and 0·01 deaths, as against 0·31, 0·30, and 0·06. Every one of these figures is less than the corresponding one for the preceding year, and we hope these may be the first fruits of a harvest that has long been worked for, the chief means employed being early recognition and separation of cases, combined with efficient ventilation of ships—such ventilation as Surgeon-Commander S. F. Dudley described on p. 853 of our last issue in his address to the School Medical Officers' Association. The new report contains several new and interesting tables. The ages of the men in the Navy are stated, their liability to tubercle of the lung at the various ages, and the liability to pulmonary tubercle in various classes of ships; there is also the usual table of men invalided at various ages. From these data we learn that there were in the Navy in 1926 some 40,000 men under 25 years of age, and some 50,000 above that age; of every 1000 under 25, 21 would probably be invalided (1·3 for accidents, 1·7 for pulmonary tuberculosis, and 0·27 for other tuberculosis), whilst the corresponding number for those over 25 would be 17·5 (0·78 for injury, 2·2 for pulmonary tuberculosis, and 0·21 for other tuberculosis). Thus after the age of 25, men in the Navy had a lessened risk of invaliding for accidents and for non-pulmonary tuberculosis, but a greater risk of invaliding from pulmonary tuberculosis. The greatest risk of developing tubercle of the lung falls at the ages between 20 and 25, and next greatest between 25 and 35, the most numerous group of all. It would be useful to have the latter group further subdivided into the ages 25–30 and 30–35, this separation being particularly important as for many men the first period of engagement ends at about 30. Battleships and barracks show the heaviest incidence; it gradually lessens through cruisers, destroyers, and submarines, and is low in training establishments. Perhaps the reason why smaller ships have fewer cases is that there is less chance of an infectious case embarking in them. Telegraphists are no longer the group most affected with tubercle, and there were but two cases in the sick berth staff; ships' cooks are rather prominent, but not outstanding, as they were in 1909, 1911, and 1914. It may be noted that enteric fever diminished in 1926, also dysentery, but there was a slight increase in malaria. A case of cholera in China is stated to have been cured, clinically and bacteriologically, within 12 hours by the mixture of essential oils recommended by Tombs. Vaccination is repeated every five years; but one slight case of small-pox occurred at Shanghai, the patient having been vaccinated four years before. Influenza increased, causing 1769 cases as against 1149 in 1925, but was comparatively mild; various methods of prevention are mentioned, but the results

[1] H.M. Stationery Office. 1928. Pp. 149. 4s. 6d.

of the preventive inoculations given are not stated. Venereal disease was less prevalent, the rate per 1000 being 67·90 (71·70 in 1925); syphilis was six times more frequent in China than at home. Calomel cream and mercuric iodide soap are the favoured preventives. The teeth of recruits and of men in the service are improving. There were 27 deaths from diseases of the digestive system, but no death from duodenal ulcer. Scabies has slightly increased, and on the average treatment lasts nearly six days. Gout has decreased (38 cases instead of 45). One man died of tetanus after an accident in the Atlantic Fleet in spite of anti-tetanus inoculation. There were several cases of encephalitis lethargica, and five deaths from cerebro-spinal meningitis. The account of the training ships is meagre, but *Impregnable* seems to have had more pneumonia and tubercle than *Ganges* (at Harwich). There is no account of the health of the cadets at Dartmouth.

THE ÆTIOLOGY OF DENTAL CARIES.

THE time has come when Mrs. Mellanby's work on the ætiology of dental caries should receive serious attention, expressing itself in a practical manner. Her main thesis is well summed up in the *British Dental Journal*,[1] and though criticism may be launched against several points, yet the general conclusions are so convincing that her recommendations should receive a widespread trial. Mrs. Mellanby's experiments on animals and her examination of human teeth all furnish evidence in support of the dietetic theory of dental caries, that is to say, the dietetic theory as it affects tooth structure; she does not deny that mechanically cleansing foods and general hygiene of the mouth may play a large part in preventing the decay of ill-formed and ill-calcified teeth, but any fundamental attack upon the problem must include an explanation of why the teeth are ill-formed and ill-calcified. She concludes from her work that two factors favour calcification, adequate anti-rachitic vitamin, either supplied in the food or else produced in the body by its direct exposure to sunlight, and an adequate supply of calcium and phosphorus in the food; a factor which hinders calcification is the inclusion in the diet of much cereal food, in which a positive anticalcifying substance has been identified by E. Mellanby.[2] A diet adequate in the two first particulars and not over-weighted with cereals, will, she believes, produce perfect teeth in the child and preserve them in the adult. For it would appear not only that well-calcified teeth may become decalcified later following a period of unsatisfactory diet, but also, and this is a hopeful finding, that badly calcified teeth may be improved by a formation of well-calcified secondary dentine when the diet is improved. As Mrs. Mellanby believes that vitamin D is the chief defaulting factor in our diet, coupled with an excess of cereals, anyone can put her theory to the test by using cod-liver oil or radiostol. In her experience the deciduous teeth of children who have regularly taken cod-liver oil are much superior in structure to those of the average child not so treated. She evidently does not believe that a deficiency of salts, particularly calcium, plays an important part as an ætiological factor in humans. The question, "Are the teeth of peoples whose diet contains abundant fat-soluble vitamins less liable to caries than those whose diets are deficient in these vitamins and excessive in cereals?" she answers, on the whole, in the affirmative, instancing the teeth of the Esquimaux and of the inhabitants of tropical countries. But she does not mention the people of Australia and South Africa, who must receive abundant vitamin D from their wonderful and continuous sunshine and yet have terribly carious teeth. To one Australian worker on vitamins the condition of her compatriot's teeth was almost an obsession; no hypothesis of vitamin deficiency will explain their condition, and one is almost forced to postulate an absolute deficiency of calcium as an explanation. Vitamin D makes available calcium which would otherwise not be available, but it cannot rectify the deficiency beyond a certain point. Recent work directed by Dr. J. B. Orr,[3] of the Rowett Institute, among school-children in Scotland, has shown that an addition of separated milk is as good a supplement for inducing growth as a corresponding addition of whole milk, which can be interpreted as evidence that an addition of salts acts very beneficially. At any rate the possibility should not be overlooked that a deficiency of calcium may exist alongside a deficiency of vitamin D in our own diet, so that an attempt to make a small increase in both these factors might be the most practical means of dealing with the problem.

[1] British Dental Journal, 1928, xlix., 769.

[2] Medical Research Council Special Report Series, No. 93.

A RADIUM-PLATINUM ALLOY.

AT a congress of science and medicine held at Hamburg in September last, Dr. Max Heiner gave an account of the use he had made of so-called radium-points, made from an alloy of radium and platinum which can be worked as easily as the latter alone. Pointed cylinders of this alloy are used just like ordinary radium tubes and needles, but with this difference: that when introduced into the body radon diffuses into the surrounding tissues and disintegrates intracellularly; so that biological effects are to be expected not only from the gamma rays, but also from the much more potent alpha and beta rays. Dr. Heiner stated that he had used points, each containing 0·1–1·0 mg. of radium element, during the past two years in the treatment of a variety of diseases, including malignant tumours, chronic eczema, psoriasis, chronic septic condition of the gums, the jaw, and nose. In chronic septic conditions of the gums the technique adopted was to insert the points into the gum pockets, leaving them in position for one to three hours, the treatment being repeated in three days. Two weeks later striking improvement was to be noted; the redness, swelling, and bleeding had disappeared, and the gums had regained their normal consistency. It appears that some 30 cases of malignant disease have been treated by the same means, the points being inserted about 1 cm. apart for periods up to 24 hours. The results claimed for this method are such as to stimulate a desire for further information.

THE BUNDABERG DISASTER.

THE puzzling feature of the Bundaberg disaster[1] was that staphylococci, according to the hypothesis, produced vomiting, diarrhœa, unconsciousness, cyanosis and pyrexia, causing death within 24 hours, and that at autopsy no scattered septic foci were found. Pathologists will be interested to learn that the investigations reported by the Royal Commission are being continued.[5] The staphylococcus, resembling No. 1393 of the National Collection at the Lister Institute, isolated from the bottle of prophylactic used "was proved by Dr. F. M. Burnet to be identical with that isolated in pure culture from the abscesses in all those children which were examined. The identity of these staphylococci was shown by their agglutination reactions with sera made from cultures of the organism isolated from the Bundaberg bottle, by the exhibition by all the cultures of the Müller phenomenon (the appearance of a zone of punctuate hæmolysis round the colonies on hormone blood agar), and by their specific reactions to a bacteriophage active against the strain from the Bundaberg bottle." Dr. Burnet obtained positive intradermic reactions in about half of a group of people tested with the filtrate of the coccus diluted 500 to 2000 times. The sera of

[4] THE LANCET, 1928, i., 202.

[5] See THE LANCET, 1928, i., 249, 1293.

[6] The Walter and Eliza Hall Institute of Research in Pathology and Medicine, Ninth Annual Report, 1927–28 (Melbourne).

some insensitive persons neutralised the filtrate: it was non-toxic to laboratory animals. But no further light has been shed on the central problem—can staphylococci, non-lethal to almost all laboratory animals, when given in large numbers together with any toxic products of growth for some days, kill human beings within 24 hours? The Commission record two cases from the Brisbane Hospital in which a septic osteomyelitis, apparently due to *Staphylococcus aureus*, caused death within 24 hours (presumably without septic metastases, though this is not stated). Such cases are not common. Neisser[6] states that a number of bacteriologists have injected into themselves thin suspensions of staphylococci without producing any effect save local septic abscesses. It is true that the mortality from staphylococcal septicæmia is high—all of 11 patients quoted by the Commission from Sydney records died—but death in these instances followed illness lasting from 3 to 21 days, and autopsy revealed the usual septic processes throughout the body; this sequence differentiated these cases from those in Bundaberg. Pathologists, while feeling that the conclusion is not in full accord with their previous knowledge and experience, must agree with the Commission that in the absence of further information the deaths must be attributed to the staphylococci.

THE MALARIA PROBLEM IN BOMBAY.

THE history of malaria in Bombay is disheartening. The city is peculiarly adapted, by its warmth and humidity, to the breeding of mosquitoes, and many localities are infested by swarms of several varieties. Modern improvements have complicated an already difficult position, and the more abundant water-supply, with its accompanying drainage system, has enormously increased the facilities for mosquito breeding. In 1911, after a systematic survey which extended over two years, a comprehensive report on malaria in Bombay was submitted by Dr. C. A. Bentley. This report has been deservedly alluded to on several occasions as classical, but in the interval many changes have occurred, and it was felt advisable to have a further survey before the Municipality committed itself to an expensive campaign. Major G. Covell was appointed to carry out observations, and his report[7] now before us sets out the results of a six months' survey, designed to supplement Dr. Bentley's work where conditions had altered in the interval.

Practically speaking, only one species of mosquito is concerned in the conveyance of the disease in Bombay, and this (*Anopheles stephensi*) breeds in fresh clean water, so that Major Covell can go so far as to remark that the problem of its destruction is entirely separate from that of the provision of adequate schemes of drainage. This mosquito breeds in wells, cisterns, garden tanks and tubs, leakages from reservoirs, improperly graded roof gutters, empty tins and other receptacles, hollows in scrap-iron, abandoned buildings, and other similar situations. The larvæ will flourish in any depth of water, and in dark places as well as those exposed to the direct rays of the sun, and one of the most fertile breeding grounds is furnished by the household wells, which are still unfortunately a feature of many of the older residences of the city. The problem of prevention is largely one of domestic economy, and is tenfold more difficult in a cosmopolitan community where people of not only one but many religions are involved. Strangely enough, the Parsees, in many ways the most advanced community in India, are one of the principal obstacles in this case. Their intensely conservative priests, who are not up to the level of their flock in general education, make use of well water for ceremonial purposes, and this is one of the chief reasons why many well-to-do Parsees refuse to fill in their wells. Entry into both Hindu and Mohammedan houses for purposes of inspection is deeply resented, and any thorough system of household visitation must be done partly by women.

The condition of Bombay as regards malaria seems to be getting progressively worse. Areas little affected 40 years ago are now seriously involved, and some of the best business and residential quarters are heavily infected. Apart from the sinister influence, direct and indirect, of malaria on the general mortality of the city, the financial effect of the excessive sick-rate on the cotton industry and other business interests is very severe, and it is easy to show that the heavy expenditure which would be involved by an extensive antimalarial campaign would be more than justified by the savings which could be expected. To make any scheme effective certain legislative action would be needed to bring under one control not only the areas directly under the municipality but also those administered by the railways and port trust, and other more or less independent bodies. It is to be hoped that means may be found to provide the necessary machinery and funds, and that the city of Vandyke Carter, who was the first in India to confirm the epoch-making discovery of Laveran, may before long emulate Ismailia and Havana, and set its house in order. The solution of the malaria problem in rural areas presents difficulties which under certain conditions may well prove insuperable, but a wealthy city like Bombay has only itself to thank if it continues to labour under this scourge.

INSTRUMENTAL AIDS FOR PARALYTICS.

CASES of extensive incurable paralysis, from whatever cause arising, can be benefited in two ways by the use of instruments; first, by the fixation as required of a flail and untrustworthy joint; and, secondly, by devices which utilise in the best possible manner any muscular power that may be still possessed by the patient. It is chiefly for the invention of such devices that the work of Dr. Gabriel Bidou has become famed, not only in France, but throughout the world. His books on mechanotherapy and orthopædic instruments are well known, and of recent years he has become specially interested in the treatment of paralysed patients. Prof. Georges Guillain enlisted his coöperation for patients of this type at the Salpêtrière, and the results obtained were so remarkable that the Director of the Assistance Publique has made arrangements to create in the near future a special service of functional recuperation under Dr. Bidou's direction. The principles which guide his treatment have been set out in a little book,[1] on the title page of which Dr. Bidou's name appears, though it is only in the preface, contributed by Prof. Guillain, that it is made clear that Dr. Bidou is actually the author. The mathematical and mechanical principles on which Dr. Bidou works, as well as certain applications of them, are well set out. His methods involve the use of a measure of the equivalence of the weight of the limb in question, of a special dynamometer, and of a rule and "musculometer" of his own as well as a goniometer. He then describes the application of various special mechanical devices which he has found useful, and also apparatus suitable for various parts of the body, both for support and for the improvement of muscular force. This is thoroughly scientific work and embodies an attempt to treat the problems presented by exact measurement of forces and of the mechanical parts concerned such as joints and limb leverage. Until Dr. Bidou devoted himself to these studies, the design and construction of orthopædic instruments had been too much a matter of rule-of-thumb, and despite the difficulties of treating living parts in the same way as the dead metal of a machine, the only hope of improvement is in the

[6] Handbuch der Pathogenen Mikroorganismen, 1927, iv., 470.

[7] Malaria in Bombay, 1928. By Major G. Covell, M.B. Lond., I.M.S. Price 2s. 6d.

[1] Principes Scientifiques de Récupération Fonctionelle des Paralytiques. By Gabriel Bidou. Preface by Prof. Georges Guillain. Paris: Le Livre pour Tous. Pp. 141, with 45 plates. Fr.20.

pursuit of his ideals. His progress as director of the special hospital of Ste. Isabelle, founded by M. E. U. de Hoz, will be watched with keen interest by all concerned with the rehabilitation of the paralysed cripple.

LIGHT AND HEAT IN MEDICINE.

THE second International Conference on Light and Heat in Medicine, Surgery, and Public Health, organised by the *British Journal of Actinotherapy*, was opened at the Imperial Institute, London, on Oct. 29th by Sir John Snell, chairman of the Electricity Commission, with Dr. F. E. Fremantle, M.P., in the chair. Dr. E. P. Cumberbatch presided at the afternoon session of the first day, and Dr. Justina Wilson in the evening. Speaking on actinotherapy in nervous affections of the skin, Dr. W. J. O'Donovan disclaimed any specific local curative value in eczema, acne rosacea, varicose ulcer, and alopecia areata. He regards these affections as local signs of "constitutional conditions"—preferably termed "nervous affections"—and ascribes the benefit derived in such cases from irradiation to its general stimulating effect, its soothing local influence, and the advantage got by a neurotic patient from treatment of good public repute. Dr. Franz Nagelschmidt, who addressed the first International Conference in London last year, has again come from Berlin to take an active part in the proceedings, and read an important paper on a new method of applying heat by diathermy. As a result of his work in Chicago University, experimenting with various wave-lengths, he has constructed a new type of diathermy machine. His aim is to introduce more energy and to avoid burns, and to this end he uses large metallic electrodes between two rubber layers. The temperature of the body can be raised to any desired degree, producing "aseptic fever," whilst loss of heat is discouraged by covering the patient, and sweating is prevented by injecting hypertonic saline into a vein. Oxygen consumption is lowered during treatment, also the breakdown of albumin, and the patient is said to gain weight. Characteristics of this new apparatus are short wave-length, high number of sparks, and high tension. Dr. Nagelschmidt advises diathermy for pneumonia, especially in unresolving cases, as a fall of temperature by lysis and occasionally by crisis is observed after treatment. A third paper was read by Dr. W. Flaskamp, chief assistant in the Erlangen University Gynæcological Clinic, where he has had ten years' experience in the treatment of gynæcological conditions by heat and light. Local and general light and heat treatment are used extensively at Erlangen in conjunction with other methods of treatment. He considers that acute inflammatory conditions of the uterus and adnexa are contra-indications to the early application of local heat and of light, but subacute and chronic conditions respond well to these methods. In the evening Dr. W. Kerr Russell, of Newcastle, gave a lantern lecture illustrating various types of lamps and therapeutic methods.

MATERNAL WELFARE AND THE GENERAL PRACTITIONER.

THE important meeting held at Westminster on Tuesday last, and briefly reported on another page, shows how the continuance of the high maternal death-rate in childbirth is moving contemporary opinion. At this meeting a resolution was passed regretting the inadequacy of the maternity services in many parts of the country, rural and urban, and pledging itself to arouse public opinion so as to raise the more backward districts to the level of the best. In delivering his presidential address to the Society of Medical Officers of Health on Oct. 19th, Dr. J. Howard-Jones took as his text prevention, and dealt with the means by which the general practitioner could forward it. Inevitably a large portion of his address was devoted to maternal morbidity. The survey of the facts which he gave will be familiar to all who are in touch with this problem, and illustrate how very difficult it is to say anything new about it. Nevertheless, it would be the gravest mistake on that account to accept our 5 per mille maternal mortality-rate as a fact of nature which could not be changed. The records of the first-class hospitals, quoted by Dr. Howard-Jones, show that it is possible to reduce death and disease in child-bearing to a very small figure indeed, provided that labour is conducted properly and, most important of all, that every mother is subjected to competent antenatal care. There is no likelihood that the hospitals and clinics will fill the antenatal needs of more than a small part of the population in the lifetime of the present generation, and it would be rather a pity if they ever did. The general practitioner is indispensable in this field; but the fact remains that, for whatever reason his efforts to reduce maternal mortality have not been very fruitful. There are two main reasons for this. The first is that the average practitioner on qualification has not been taught enough about antenatal work. Dr. Howard-Jones pointed out that most of the older midwifery text-books pass it over with a desultory mention, and only in the most recent ones is it given the thorough and systematic attention it deserves. The science of gynæcology and obstetrics is generally admitted to be the Cinderella of the medical curriculum; its teachers have to struggle hard to complete even the essentials in the time allotted to these subjects, and it is small wonder that a comparative newcomer like antenatal work should be crowded out. So instead of accepting this duty as a matter of course, the student finishes his training with neither definite plan nor definite inclination to break what is still new and stony ground. The difficulty of this task, when he does undertake it, is the second reason why it is so badly neglected. The public are not nearly educated up to requiring antenatal care, still less to paying for it. One of the speakers at the meeting of the obstetrical section of the British Medical Association at Cardiff this year, a practitioner of many years' experience, narrated how he had attended a woman of the labouring class in a very anxious confinement and had warned her solemnly that unless she came to be examined in good time before her next confinement he would have nothing to do with it. His next meeting with her was in the middle of her next labour, to which he had been urgently summoned to deal with a precisely similar complication. This undoubtedly typifies a very general attitude; in plain words, most women of the less educated classes, and probably of the better educated classes as well, will not be bothered. Again, when a conscientious doctor does manage to bully his patients into coming up for examination, he finds them unwilling to pay him anything like adequate remuneration. They do not appreciate the importance of the service, and they grudge the money. On the other hand, a fair number of town practitioners have found that patients will not cavil at an inclusive fee, one not perhaps as large as it ought to be, but at any rate one which marks a distinct recognition of the value of antenatal treatment. Perhaps this is one of the most promising lines of approach. Dr. Howard-Jones recognises that this branch of preventive medicine, like every other, depends entirely on the education of the public, but he does not indicate how this education is to be achieved. In America great efforts are made through the lay and semi-lay press; here most of the burden falls on the devoted head of the individual practitioner, whose efforts are promptly met with the accusation of self-seeking. The practitioners of this country have the pioneering and altruistic spirit very highly developed, but they have every right to expect more support. This can be most effectively given in the form of propaganda, chiefly in the lay press. In Soviet Russia, where most of the amenities of civilisation are at their lowest, the Government handle the problem of antenatal propaganda in an effective way by keeping persuasive reading matter, illustrated by attractive and intelligible pictures, constantly before every worker and peasant in the

country on hoardings and in newspapers. A certain amount is done here by individuals and voluntary bodies, but it is very little. Not until the central authority takes a lead in this matter will the problem be within sight of solution. The investigation of every death in childbirth by the Ministry of Health (see p. 944) is a step in this direction.

A STATE PSYCHOLOGICAL CLINIC.

THE first annual report of the State Psychological Clinic recently established at Perth, Western Australia,[1] is a modest account of work done, with an outline of further needs and proposals for meeting them. The ground covered by what is admittedly little more than a skeleton staff includes school surveys of normal children and the study and treatment of delinquent and retarded children in the care of the State Children's Department, or reported from the schools, referred by the Children's Court, or brought to the clinic privately. Among the last group were 121 cases out of a total of 260, and we learn also that adult patients took advantage of the clinic for advice or treatment, and that, although smallness of staff and limitations of time seriously hindered the work, yet an attempt is made to treat them by suggestion or psychological analysis. The organisation of the clinic arranges for coöperation with Perth Hospital and the Children's Hospital, whilst the Inspector-General of the Insane acts both in an advisory capacity and as clinic psychiatrist, thus providing a link between asylum and out-patient treatment. Miss Stoneman, the psychologist in charge of the clinic, is also lecturer to the University, and the report expresses the hope that the University will provide recruits who will in the future shoulder the work of testing, teaching, and caring for defectives and abnormal individuals. A scheme for a fully developed department is diagrammatically represented, and includes a University training centre in touch with clinics and day or residential schools, with farm colonies, hostels, and small institutions for special defectives. It is probable that a representative of every item in the scheme could be found in this country. We have our institutes for defectives; in one city a psychologist is attached to a children's court; in another city is a school psychologist, whilst somewhere else is a gaol where there is opportunity for skilled investigation of the mental state of a delinquent. We have one or two clinics where a psychoneurotic child or adult can obtain treatment, and a student with a powerful inner urge and a knowledge of the ropes might learn a little here and a little there which he could piece together into a coherent whole, thus making himself fit to undertake the kind of work described in this report. Efforts are being made to remedy our obvious lack of organisation and also to give medical students an insight into those aspects of psychopathology that are necessary for the general practitioner, faced as he is by problems for which his present training leaves him poorly prepared; but the difficulties are great, and we must envy a new country where a coördinated scheme can be planned from the beginning.

HEAT CRAMP ON SHIPBOARD.

NOT so long ago heat cramps were frequently reported from the stokeholds of men-of-war in the tropics, when they were regarded as a form of heat-stroke: 82 cases occurred in a year on an American ship, and 42 at one time on the French *Bugeaud* in the Red Sea in the year 1900. But oil-burning steamers are increasing and such occurrences are diminishing. Their interest lies in the observation that it was not in the hot engine-room that the cramps occurred but in the cooler better-ventilated stokehold, where heavy toil evoked profuse sweating, to which rather than to the high temperature they are now ascribed. The matter is discussed in two recent papers, one by Surgeon-Captain P. Cazamian,[1] and the other by Lieut.-Commander E. E. Smith, Medical Corps, U.S.N.[2] The syndrome is perhaps best described by Pryor in his "Naval Hygiene" (1918, p. 367). During or after exertion, cramps commence generally in the calves, spreading to the other limbs and abdomen, temperature is raised little if at all, albuminuria is always found. The resemblance of these to the cramps of cholera has been noted, and Willcox (quoted by Smith) described a choleraic type of heat-stroke in Mesopotamia. Cazamian ascribes the cramp, which he regards as a tetany, to diminution by sweating of the free Ca-ions in the blood. Guanidine is formed more freely from creatine in the increased metabolism due to the high surrounding temperature, and in Noël Paton's view it was the Ca-ions which protected the nerve-cells against its attack. Cazamian therefore suggests the administration of calcium chloride in a dose of grs. 60 or more. The exposure of firemen is only intermittent; perhaps that is why so many forms of treatment are thought successful. Sudden death may be due to tetany of the heart muscle which is known to occur in dogs exposed to great heat; after death acute interstitial congestion of the lung and cloudy swelling of the renal tubules are found. Smith does not confidently recommend any form of treatment. Pryor advised sugar as a preventive, and in the British Navy stokers get oatmeal water with lime juice and sugar. The subject requires further examination.

A REPRESENTATIVE council has been created under the new Medical and Pharmacy Act of the Union of South Africa, and the following members have been elected by the medical practitioners of the Union:—Transvaal: Sir Spencer Lister, Dr. R. I. Mackenzie, Dr. C. Porter, and Dr. A. W. Sanders. Natal: Dr. W. T. F. Davies and Dr. A. Mackenzie. Cape Province: Dr. W. Darley-Hartley, Prof. M. R. Drennan, and Dr. D. J. Wood. Orange Free State: Dr. S. M. de Kock. The Government nominees on the council are: Dr. J. A. Mitchell, Dr. J. T. Dunston, Dr. A. J. Stals, and Mr. W. Rood; and the first meeting was held on Oct. 22nd.

THE Society of Apothecaries of London held its first examination for the Mastery of Midwifery from Oct. 15th to 18th, and it is announced that the following candidates were approved: G. D. Eccles (M.B.), R. K. Ford (M.B.), J. A. Lee (M.R.C.S.), F. P. N. Parsons (M.B.), and H. J. D. Smythe (M.S.).

WE regret to announce the death at Falmouth, in his sixty-ninth year, of Dr. F. J. Wethered, consulting physician to the Brompton Hospital, sometime physician and lecturer on medical jurisprudence at the Middlesex Hospital, and a valued member of the staff of this journal.

WE have also to record the death of Sir George Stewart Abram, physician to the Royal Berkshire Hospital, and formerly Mayor of Reading, in his sixty-third year.

[1] Fred. Wm. Simpson, Government Printer, Perth, W.A.

[1] Archives de Médecine Navales, 1928, p. 100.
[2] U.S. Naval Medical Bulletin, 1928, p. 479.

Mr. R. J. McNeill Love and Dr. F. C. Martley have been elected directors of the Medical Sickness Annuity and Life Assurance Society, Limited.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—A meeting will be held at the Society's house, 17, Bloomsbury-square, London, W.C., at 8 P.M. on Tuesday, Nov. 13th, when Mr. C. J. S. Thompson, formerly Curator of the Wellcome Historical Medical Museum, will give an address on the Apothecary and Some Curious Materia Medica of the Seventeenth Century, illustrated by new specimens from the Society's museum.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

IX.—THE INTERPRETATION OF THE BLOOD COUNT.

By S. C. Dyke, D.M. Oxf., M.R.C.P. Lond.,
CONSULTING PATHOLOGIST TO THE WOLVERHAMPTON AND STAFFORDSHIRE HOSPITAL.

THE pathologist faced with a demand for a "full blood count" or "examination of the blood picture," gathers that he is being asked to report upon the state of the formed elements of the blood. The principal of these are the red cells or erythrocytes, and the white cells, and unless more is specifically asked for, most pathologists will confine themselves to the description of these. So far as these elements are concerned, the practitioner, in receiving a full blood count, is entitled to expect information as to the following points:—

Red cells—total number per c.mm., the percentage of hæmoglobin in the blood, the percentage of the normal load of hæmoglobin carried by each red cell, otherwise known as the colour-index, and the presence or absence of abnormal forms.

White cells—the total number, the relative percentages of the various types, otherwise known as the differential count, and the presence of abnormal forms.

Certain other particulars as to the formed elements of the blood may be of value in certain types of cases and may be asked for, or information concerning them may be thrown in by an especially zealous pathologist. These will be in a future article, but they do not form a part of the "full blood count," as usually understood.

A report on the blood-picture may, or may not, supply valuable information in the understanding of a case. Whether or not it is to do so depends not only upon the nature of the case but also upon the knowledge of certain general principles on the part of the interpreter. It is to the discussion of these general principles that it is proposed to devote this article.

PART I.*—THE RED CELLS.

The following table of the normal red cell count indicates figures which are approximate only, and may vary beyond the suggested limits:—

Red Cells of a Normal Person.

Total number	5,000,000	to	6,000,000
Percentage of hæmoglobin	80	,,	105
Colour-index	0·75	,,	1·0
Abnormal forms			*Absent.*

Hæmoglobin Percentage.

When the question at issue is the presence or otherwise of anæmia, the hæmoglobin percentage is of prime importance. From this standpoint the function of the blood is to carry hæmoglobin; if hæmoglobin is present in reasonable amount anæmia does not exist or is negligible: if the hæmoglobin is diminished the diagnosis, so far as it goes, is established. This point may seem too simple to be worthy of discussion, but the fact that pallor does not necessarily mean anæmia is far from being generally recognised, and everyone concerned with the examination of the blood has many times had to explain to the clinician that, deathly though his patient may appear, the hæmoglobin percentage is normal and there is no anæmia. There are many ways of estimating the hæmoglobin percentage, and it is unfortunate that they do not all work to the same standard. 100 per cent. of hæmoglobin should represent the percentage present in normal persons; in actual practice, no matter what method is used, the percentage in the majority of normal persons is found to fall somewhat below this figure. It may vary during the day, and in women it is a little lower than in men, but no matter when or from whom the specimen may be taken, anything from 80 to 105 per cent. may be regarded as perfectly "normal." Some degree of anæmia demanding treatment may be regarded as being present when the hæmoglobin percentage is found to be 60 per cent. or below; when 35 per cent. is reached the anæmia may be regarded as severe, and when it falls to 20 per cent. or below, the infusion of blood is strongly indicated.

The Cell Count.

Five million red cells per c.mm. of blood is usually regarded as constituting a normal count. This figure is purely arbitrary: in young healthy males a count of 6,000,000 per c.mm. may be met with and counts of 5,500,000 are frequent. In females the count is usually lower than in males. Congestion, either local or general, tends to send up the red count; on this account blood withdrawn by venipuncture in the usual way after the application of a tourniquet shows a higher red cell count than blood taken by skin puncture without engorgement; for the same reason cases of right heart failure with much congestion usually give a high red count; the great increase in the number of red cells resulting from sclerosis or partial occlusion of the pulmonary arteries is well recognised.

Polycythæmia Vera.—Increase of the red cells from these causes is to be distinguished from those "idiopathic" cases in which no such causes are to be found. These fall under the head of *Polycythæmia Vera*, Vaquez' or Osler's disease. Such cases are rare and the diagnosis should be made with caution. It should not be thought about until the red cell count has passed 8,000,000 per c.cm.

Colour-index.

In the simple diagnosis of anæmia the red cell count is of less importance than the hæmoglobin percentage. It is no unusual occurrence to find patients with their full complement of red cells, but with the hæmoglobin reduced to 50 per cent. or less of normal. Such patients are anæmic and require treatment in spite of the normal red cell count. More important than the simple number of red cells present per c.cm. is the load of hæmoglobin carried by each. This is expressed as a percentage of the entirely arbitrary "normal" of 5,000,000 per c.mm. Although arbitrary, the convention is of the greatest use. The figure is known as the colour-index.

The colour-index is obtained by dividing the hæmoglobin percentage by the percentage of normal of red cells per c.mm. It is intended to express the percentage of the normal load of hæmoglobin carried by each red cell. For purposes of the computation of the colour-index the normal of the red cell count is taken as 5,000,000. As most normal individuals have under the arbitrary 100 per cent. of hæmoglobin and over the arbitrary 5,000,000 red cells per c.mm., it follows that the normal colour-index is always under unity. A colour-index of 1·0 is unusual in healthy persons.

In all cases where each red cell carries below its normal load of hæmoglobin the colour-index will be low. The best example of anæmia of this type is afforded by *chlorosis*, in which the red cells may be only slightly or not at all diminished, but in which each cell carries too small a load of hæmoglobin. One of the diagnostic points of this condition is the presence of a low colour-index. Most forms of secondary anæmia, whether due to disease or to hæmorrhage, are also associated with a low colour-index. In fact, the only condition characteristically associated with a high colour-index is *primary, Addisonian, regeneratory, or pernicious anæmia.* It

* Part II.—The White Cells—will appear next week.

is now usually supposed that the high colour-index in this condition is due to the unusually large size of the majority of the cells, the cells in bulk thus carrying an abnormally large load of hæmoglobin for their number. In this respect it is important to remember that a normal colour-index is not unity. A colour-index of 1·0 is definitely high and by no means incompatible with a diagnosis of pernicious anæmia.

Morphological Abnormalities.

If, in the stained film, the red cells appear normal, the pathologist may not consider it necessary to mention the matter. Abnormalities, however, are of importance and will always be recorded. The morphological abnormalities of the red cells fall under three heads: the presence of embryonic or young forms, the occurrence of abnormalities of shape and size, and unusual staining reactions.

Embryonic Forms of Red Cells.—The presence of such forms is an indication of unusual activity on the part of the hæmatopoietic system. Their occurrence or otherwise is thus of importance in determining whether or not a satisfactory response is occurring after hæmorrhage, and it may be of the last importance in distinguishing pernicious or regeneratory from aplastic or a regeneratory anæmia. The detection of a single embryonic red cell in a film is sufficient to negative a diagnosis of aplastic anæmia. Red cells are usually regarded as "embryonic" so long as they still bear the nucleus which is normally extruded before they leave their birthplace If of normal size, these nucleated cells are known as *normoblasts*, and their presence in the films of blood from any case of anæmia is merely an indication of a healthy state of activity on the part of the red bone-marrow. If of more than normal size, such nucleated cells are described as *megaloblasts*. The detection of megaloblasts in a blood film is practically sufficient to establish a diagnosis of primary anæmia, though the reverse is far from being the case. In addition to the embryonic nucleated forms certain young though hardly embryonic cells are always present in the blood and occur in large numbers under special circumstances. These are the reticulated red cells or *reticulocytes*. The examination for these must be conducted on fresh blood, and if such is required special arrangements must be made with the pathologist. Examination for them forms no part of the blood picture, as the term is usually understood. Reticulocytes are present in the blood of normal persons in a proportion of from 0·1 to 1·0 per cent. of the red cells. In conditions of active blood regeneration their percentage may be greatly increased. They have acquired a certain prominence lately owing to the fact that one of the first detectable results of a satisfactory response on the part of a case of pernicious anæmia to treatment by liver is a great increase of the reticulocyte percentage.

Abnormalities of size and shape of the red cells are of importance.

Irregularity of size of the cells, some being greater and some smaller than normal, is known as *anisocytosis*. It is usually a feature of the films from cases of pernicious anæmia, but it is quite justifiable to make the diagnosis in the absence of this phenomenon, and its presence does not necessarily imply the existence of that condition. *Microcytosis* or the preponderance of red cells of unusually small size is a feature of many cases of familial hæmolytic anæmia: it is not, however, of great diagnostic importance.

Irregularities of shape are grouped under the heading of *poikilocytosis*. Both anisocytosis and poikilocytosis are usually marked in pernicious anæmia, but they may be absent in this condition and present in other types of anæmia. They have diagnostic value, but there is a tendency to attach too much importance to them.

Unusual Staining Reactions.—In examining blood films it is customary to stain them with one of the dyes of the Romanowsky series usually Leishman or one of its modifications, Jenner, or Giemsa. All these dyes stain the cytoplasm of hæmoglobin-bearing red cells some shade of red, while nuclear material and certain cytoplasmic inclusions occurring abnormally are all stained blue. When the blue dye takes to some extent in the cytoplasmic material of the red cells the condition is known as *polychromatophilia* or *polychromasia*. The staining may be diffuse, in which case it merely indicates a deficiency of hæmoglobin in the cytoplasm or certain definite inclusions may take the blue or basic dye. These inclusions may appear as blue dots in the pink cytoplasm, in which case the condition is described as *punctate basophilia* or *basophile stippling*; in other cases circular or irregularly shaped blue markings may appear in the cytoplasm. These are the "Howell-Jolly bodies" and are usually regarded as being portions of unextruded nuclear material. All the phenomena of polychromatophilia are indications of an unfinished state on the part of the red cells and, as such, point to unusually rapid blood formation. They may all occur in any form of profound anæmia with the exception of the aplastic type, in which blood formation is lacking. They are frequently regarded as characteristic of pernicious anæmia, but this is far from being the case. Basophile stippling or punctate basophilia is of constant occurrence in established plumbism, and no diagnosis of lead-poisoning should be made without search for this feature.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Comdr. F. E. Bolton is placed on Retd. List with the rank of Surg.-Capt.

Surg. Lt.-Comdrs. S. R. Johnston and C. N. Ratcliffe to be Surg.-Comdrs.

Surg. Lts. A. G. L. Brown and P. J. Maguire to be Surg. Lt.-Comdrs.

The following appointments are notified:—Surg.-Comdrs.: J. L. Priston to *President*, for Medical Dept.; E. Heffernan to *Excellent*, and as Ophthalmic Specialist; and T. C. Patterson to *President*, for Naval Medical School, Greenwich. Surg. Lt. L. J. Corbett to *Vulcan*, temp.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt.-Comdr. R. Hall to *Victory*, for R.N. Hospl., Haslar, for training.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. B. F. Wingate retires on retd. pay and is granted the rank of Col.

The resignation of Lt. (on prob.) J. C. Gilroy is cancelled.

General List.—Temp. Lt. H. I. Clapperton, Dental Surg. (Temp. Flying Offr., R.A.F.), to be Temp. Capt.

TERRITORIAL ARMY.

Capt. A. Bremner (late R.A.M.C.) to be Capt.

Lt. D. R. McGregor is restd. to the estabt.

The King has conferred the Territorial Decoration upon Majs. A. J. Gibson and H. Forrest.

ARMY DENTAL CORPS.

G. E. Nettleship to be Lt. (on prob.).

ARMY RESERVE OF OFFICERS.

The undermentioned Lt.-Cols., having attained the age-limit of liability to recall, cease to belong to the Res. of Off.: R. F. M. Fawcett, J. Dorgan, and H. W. Long.

INDIAN MEDICAL SERVICE.

Lt. J. Quigley to be Capt (prov.).

PATHOLOGICAL LABORATORY AT HALIFAX.—A pathological laboratory and two open-air wards have been added to the Royal Halifax Infirmary, and Dr. H. V. Phelon has been appointed pathologist.

MANCHESTER MEDICAL CHARITIES FUND.—The Manchester and Salford Medical Charities Fund (the Hospital Sunday Fund and Allied Societies) in the year ending June 30th distributed £40,147 to various medical charities. In 1916 £3100 was distributed, in 1919 £5715, and in 1926 £39,703.

Special Articles.

INFANT MORTALITY AND ECONOMIC STATUS.*

BY PETER L. McKINLAY, M.D., D.P.H. GLASG.

(From the National Institute for Medical Research, Hampstead.)

WHEN we desire to measure the effect of some possible or probable factor upon the death-rate we always seek to neutralise any other variable factor the influence of which, however intrinsically important, is not relevant to the object of the immediate inquiry. Thus, if we are for the moment interested in the influence of occupation upon mortality, we should seek to allow for the variation in the age distributions of workers in different occupations, because age is a predominant factor of mortality and variations of age might mask any other difference. Many expedients have been devised to this end, and each has its advantages and disadvantages. A much-used method, rejoicing in the formidable title of indirect standardisation, may be simply illustrated. Let us suppose a simple dichotomy of the population into A's and B's, and that the average death-rate of the A's is twice that of the B's, say 20 per 1000 and 10 per 1000 respectively for *all* the A's and B's of the population, without regard to their occupations, place of residence, or any other matters. We now wish to study the effect of, say, occupation upon mortality, and we find that the proportions of A's to B's vary from occupation to occupation, and that in each occupation we can measure the ratio of all deaths to population but cannot distinguish between the *deaths* of A's and deaths of B's, although we can distinguish between the *enumerated* A's and B's at a recent census. Then we might proceed in this way. We might take as a "standard" a population with 50 per cent. each of A's and B's which, by hypothesis, would have a death-rate of 15 per 1000. Now suppose we have two occupations in one of which the proportion of A's is 25 per cent., and in the other it is 75 per cent., and that in one the death-rate is 12 per 1000, and in the other 18 per 1000. We should expect the former group to have a lower death-rate, whatever the effect of occupation on mortality, because it contains a much smaller proportion of A's who, under average conditions, have a higher rate of mortality than B's. Is it reasonable to attribute all the difference to this circumstance?

Let us suppose that in each district the rates of mortality were exactly average, and the gross difference wholly due to a change in the proportions of A's. In the first group we should expect a death-rate of $0{\cdot}25 \times 20 + 0{\cdot}75 \times 10 = 12{\cdot}5$ per 1000, instead of 15 per 1000, and in the second group we should expect a death-rate of $0{\cdot}75 \times 20 + 0{\cdot}25 \times 10 = 17{\cdot}5$ per 1000, instead of 15 per 1000, the gross rate when A's and B's are equal in number. We thus see that the group rates actually found, 12 and 18, are not exactly what they would have been had the assumption been correct, but we also see that this factor *might* so nearly account for the observed difference that it could not be sensible to compare 12 and 18 as if the varying proportions of A's could be neglected. What shall we do? An obvious suggestion is to multiply the observed rates by factors which would make the resultants exactly the same *if* the differences were entirely due to varying proportions of A's. The required factors are 15/12·5 and 15/17·5 respectively —i.e., 1·2 and 0·8571. Multiplying the observed rates 12 and 18 by these factors we reach 14·4 and 15·4 as values which, on our hypothesis, are reasonably comparable as measures of contrasting factors other than the varying proportions of A's.

The most serious assumption involved in this process—from the point of view of medico-statistical interpretation—is that in different groups the relative mortalities of A's and B's should be the same. It is easy to imagine cases where the assumption is absurd. Thus, suppose our A's were soldiers and our B's civilians and that a "little war" was on, and one of our groups was in the fighting zone. The method of correction would go a very little way towards freeing the geographical comparison from the effects of varying proportions of A's and B's, because if it was really a very little war its effect upon the standard rates of mortality for all soldiers and civilians would be very small. Nevertheless, the method is a valuable one, and has been widely used to eliminate variations of age constitution in population groups it is desired to compare. The object of this paper is to illustrate its use in another demographic field.

We know that economic status is a factor of mortality—whether directly or indirectly is a question which does not now arise—and we know that the rate of infant mortality seems to be particularly sensitive to variations of economic well-being. We know also that the proportions of "rich" and "poor" vary greatly in different administrative areas. If we adjust the local rates of infant mortality by the method described above, do we appreciably reduce the inter-local variation? The recent publication of the Registrar-General's Decennial Supplement (Part II.) relating to occupational mortality, fertility, and infant mortality has made it possible to answer that question. The object of the present note is (1) to describe a simple method by which such a correcting factor for differences in social position may be obtained, and (2) to ascertain (*a*) how far, when such correction is made, the variation observed in the rates of infant mortality in a sample of districts will be reduced, and (*b*) whether the position of the several districts in respect of mortality is altered by such a correction.

Correction for Variations in Social Status.

From Table H of the report referred to previously the number of births and the number of deaths of infants under one year of age from various causes or cause-groups can be obtained for each of the five social classes recognised in these official reports. (These are Classes I., III., and V., consisting of the upper and middle classes, skilled workers and unskilled workers respectively, and Groups II. and IV. intermediate between I. and III. and III. and V. respectively.) From these data the rates of mortality per 1,000,000 births are calculated, and comparative

TABLE I.—*Relative Mortalities in Different Social Classes.*

—	(1)	(2)	(3)	(4)	(5)
Infectious diseases	0·22	0·57	0·96	1·19	1·31
Tuberculosis (all forms) ..	0·38	0·68	0·93	1·26	1·11
Diarrhœa and enteritis ..	0·32	0·59	0·91	1·13	1·42
Developmental and wasting diseases	0·64	0·81	0·98	1·09	1·14
Bronchitis	0·14	0·53	0·98	1·21	1·21
Pneumonia	0·28	0·53	0·97	1·16	1·36
Bronchitis and pneumonia ..	0·23	0·53	0·98	1·19	1·32
Syphilis	0·22	0·47	0·93	1·21	1·41
Rickets	0·36	0·59	0·86	1·14	1·50
Convulsions	0·51	0·63	1·01	1·16	1·13
Congenital malformations ..	0·98	0·96	1·00	1·02	1·01
Congenital debility and sclerema	0·34	0·67	0·96	1·15	1·25
Premature birth	0·63	0·81	0·99	1·09	1·12
Injury at birth	1·32	1·16	0·97	1·04	0·86
Suffocation in bed	0·45	0·60	0·91	1·08	1·60
Infant mortality	0·48	0·70	0·97	1·13	1·23

mortality figures for each disease group then obtained by expressing the death-rates pertaining to the legitimate births of each of the classes as a fraction of that of all legitimate births in England and Wales (the data refer to the single year 1921). In Table I. these are presented for all the causes of infant death supplied by the report. The varying degrees to which economic conditions affect the several causes of death

* Since the completion of this paper in June, a paper by Dr. Percy Stocks has appeared in the Annals of Eugenics, vol. iii., Parts 1 and 2, in which similar ideas are involved.

in infancy are thus clearly demonstrated. They range from cases where the higher the social class the higher the rate of mortality—e.g., injury at birth—through a point of indifference in the group of congenital malformations, to an immense advantage for the more prosperous classes in such groups as the common infectious diseases, bronchitis and pneumonia, syphilis and infantile diarrhœa. Discussion of the reasons for these differences will not be attempted here.

The male inhabitants of the districts to be considered must now be distributed into the five social groups of occupation. Information on the occupations of the male population is obtained from the census reports, in which the occupations of males aged 12 years and over are given for individual districts; from this combined with Table A, col. 7, of the Occupational Mortality Report, which gives the recognised social rank of each occupation, we are enabled to obtain the social distribution of each district. The further procedure, which is only an elaboration of my hypothetical example of A's and B's, is made more intelligible by reference to the example given on Table II., where the case of the

TABLE II.—*Example of Method of Correction for Social Status. (Metropolitan Borough of Hampstead.)*

Social class.	Population.	Weights.	Weighted population.
(1)	2,686	0·4847	1,301·9042
(2)	8,523	0·6998	5,964·3934
(3)	8,433	0·9708	8,186·7564
(4)	1,789	1·1295	2,020·6755
(5)	1,603	1·2264	1,965·9192
—	23,034	—	19,439·6507

$$\text{Correcting factor} = \frac{23{,}034{\cdot}0000}{19{,}439{\cdot}6507} = 1{\cdot}1849.$$

Crude infant mortality-rate (1921–3) = 55·3 per 1000 births.
Corrected infant mortality-rate (1921–3) = 55·3 × 1·1849 = 65·5 per 1000 births.

metropolitan borough of Hampstead is considered. The comparative mortality figures for total infant mortality are shown in the third column of this table. The adult male population of the borough, enumerated at the census of 1921 in each of the five social classes (col. 2), must now be multiplied by their appropriate C.M.F., and these weighted populations (col. 4) summed. It will be apparent, a priori, that in any district having a social distribution exactly similar to that of the country as a whole, the sum of the weighted populations must be equal to the actual numbers enumerated at the census. If, however, the proportion of males classified to Groups I. and II. be in excess of that pertaining to England and Wales (and the remaining social groups correspondingly in defect) the sum of the weighted population will be smaller than that actually enumerated. Conversely, a population relatively deficient in males of the upper classes will have a weighted population in excess of that enumerated. To obtain the correcting factor for any disease group, then, the actually enumerated population must be divided by the sum of the socially weighted population. The factor thus obtained, when in excess or defect of unity, denotes the existence in the district under consideration of a population constituted with respect to infant mortality (or any of its components) favourably or adversely respectively compared with the country as a whole (the "standard" population). The crude rate of mortality in each district, stated per 1000 births, is now multiplied by its correcting factor for social status, and we thus obtain a distribution of mortality-rates for a series of districts for which variations of economic distribution have been stabilised, so far as the method permits. From the example furnished by Hampstead (Table II.) we see, as is well known from other considerations, that this borough is well above the average social level, and that, reduced to the status of the standard population, the rate of infant mortality would be 18·5 per cent. above that actually recorded—i.e., a rate of 65·5, compared with the crude rate of 55·3 per 1000 births.

Reduction in Variability of the Rates of Infant Mortality.

For the purpose of testing how much closer to one another the rates of mortality would be in a given set of districts if the effect of varying economic status among them were eliminated, the ideal district would be one in which as many as possible of the other factors influencing the rates of mortality in infancy could be deemed sensibly constant. From this point of view, the metropolitan boroughs of London form as near an approach to the desired sample as it is possible to obtain in this country. They are all essentially urban in character, the type of housing (as opposed to the amount of accommodation available) varies little, and geographical and climatic influences may be presumed constant for all. These, therefore, have been chosen for this investigation. Correcting factors have been calculated, as described above, for each borough for total infant mortality and several groups of diseases; and comparison has been made between the conventional mortality-rates and those found after correction for social status. Table III. presents a contrast between

TABLE III.—*Example of the Effect of Eliminating Social Differences.*

—	Crude rates.			Corrected rates.		
	Hampstead	Poplar	Ratio pH.	Hampstead	Poplar	Ratio pH.
Infant mortality ..	55·3	74·4	1·35	65·5	70·7	1·08
Infectious diseases	2·8	5·2	1·86	3·6	4·8	1·33
Tuberculosis ..	0·8	1·4	1·75	1·0	1·4	1·40
Diarrhœa	7·5	9·9	1·32	9·5	9·1	0·96
Congenital debility	23·3	29·3	1·26	26·0	28·4	1·09
Bronchitis and pneumonia	8·0	16·9	2·13	10·5	15·7	1·50

the mortality experienced by the socially best and worst boroughs in the group—namely, Hampstead and Poplar. In the triennium 1921–3, Poplar showed a rate from all causes under one year 35 per cent. in excess of that in Hampstead, but when allowance is made for the wide divergence in the social level of these two districts, this excess is reduced to 8 per cent. Similarly, in the chief cause-groups of death considered, much of the original difference between the two is effectively or, in the case of diarrhœa and enteritis, completely eliminated. These figures suffice to show that in isolated instances we are able to effect a great reduction in the range of the mortality-rates when suitable correction is applied for economic divergences.

But the real problem is a more generalised one. What in bulk is the difference in the amount of dispersion in the rates of mortality when correction is or is not made for social differences? Do we, in fact, after such correction tend to reduce all districts to a mortality experience sensibly equal? The only suitable statistical measure for furnishing an answer to such questions is the coefficient of variation, a constant which expresses the absolute variation in terms of the mean value of the rates of mortality. These, with their probable errors, are given in Table IV. From these results it is clear that although in every group the variability is slightly reduced, in not one instance is it possible to attach statistical significance to the difference found. Thus in this sampled population the tendency towards a levelling of the rates of mortality is a very slight one. Moreover, when we recollect that the various disease-groups considered here are affected in different degrees by the conditions pertaining to differences in social status, no evidence is contained in these figures that the differences in the dispersion of each of these rates would be eliminated if we considered only districts of the same level socially. Stated

otherwise, the death-rate from all forms of tuberculosis varies much more from place to place than, for example, that from congenital debility, and this greater variation is not at all because tuberculosis

TABLE IV.—*Coefficients of Variation (Metropolitan Boroughs).*

—	Crude rates.	Corrected rates.
Congenital debility	11·09 ±1·01	9·32 ±0·84
Diarrhœa and enteritis ..	27·05 ±2·61	24·63 ±2·34
Bronchitis and pneumonia ..	29·06 ±2·83	25·55 ±2·44
Infectious diseases	31·79 ±3·14	28·93 ±2·82
Tuberculosis (all forms) ..	39·62 ±4·09	38·11 ±3·90
Infant mortality	14·99 ±1·38	12·58 ±1·15

is more closely related than is congenital debility to social and economic factors.

Alteration in the Relative Position of the Districts.

The 28 boroughs have been ranged in order from the lowest to the highest with regard to both the crude and corrected rates of infant mortality from all causes and from separate cause-groups. Correlations have then been deduced between the rank which each borough occupies in the distribution of crude and corrected rates. These are collected in Table V. It

TABLE V.—*Coefficients of Correlation (Metropolitan Boroughs).*

Infant mortality	0·951
Infectious diseases	0·970
Tuberculosis	0·992
Diarrhœa..	0·945
Congenital debility	0·953
Bronchitis and pneumonia	0·978

is at once clear from the magnitude of these coefficients that no great change has been effected in the position of the boroughs generally. Those which originally occupied favourable positions have still, after eliminating economic variations, the more desirable rank. The most noteworthy differences, which, it will be seen, are by no means very great, need only be summarised. The two figures after each borough mentioned relate to the position occupied when crude and corrected rates respectively are considered.

All Causes.—Finsbury (23, 18); Poplar (17, 10); Hampstead (2, 6); Holborn (20, 24); Greenwich (8, 4); St. Marylebone (12, 16).

Common Infectious Diseases.—Finsbury (13, 9); Poplar (16, 11); Wandsworth (9, 13).

Tuberculosis.—Hampstead (5, 8).

Diarrhœa and Enteritis.—Bermondsey (21, 15); Finsbury (18, 13); Poplar (11, 5); Hampstead (2, 9); Holborn (15, 21).

Congenital Debility.—Hampstead (2, 8); Poplar (23, 17).

Bronchitis and Pneumonia.—Poplar (21, 15).

Are we entitled to infer from these results that economic status has no intrinsic influence upon rate of mortality or—to put it more bluntly—that if Mr. Bernard Shaw's ideal were realised and all family units enjoyed the same incomes, the variability of the rates of infant mortality of the London boroughs would be much what they are now? I pointed out at the beginning that this method of standardisation rests upon an assumption which may lead us into error. Until I have had an opportunity of applying it more widely—it can obviously, now that we have the rich harvest of results contained in the new Decennial Supplement, be used to standardise mortality in all or any age-group—I prefer to draw no more definite conclusion than that, in spite of the great contrasts between the rates of mortality of different economic groups, standardisation for economic status does not reduce variability so much as seemed a priori probable. I have published these preliminary results in the hope that other medical men may be tempted to use, and criticise, the method.

MINISTRY OF HEALTH.

ANNUAL REPORT OF THE CHIEF MEDICAL OFFICER, 1927.

(*Continued from p. 888.*)

RESPIRATORY DISEASES.

THE second group of the five conditions responsible for 64 per cent. of the death-rate consists of bronchitis, pneumonia, and other respiratory diseases. Most of these diseases are only preventable by general hygienic measures, especially ventilation and proper clothing, and that section of the male adult population which is exposed in late middle life to changeable and harsh climatic conditions cannot hope to escape some bronchial trouble. But such an acute disease as lobar pneumonia ought to be more amenable to preventive measures than it has hitherto proved. In the pathological laboratory of the Ministry Dr. F. Griffith has been concerned since 1920 in an attempt to throw light on the incidence and pathology of lobar pneumonia by investigating the serological types of the causative organism.

The Ætiological Significance of Pneumococcal Types.

In studying pneumococcal types he has followed the American classification, which divides pneumococci, by serological tests, into Types I., II., III., and IV., and has employed as his standards cultures obtained direct from the Rockefeller Institute. Type IV. is not really a "type," but the residual collection of strains which do not conform to any of the preceding types and present great serological diversity amongst themselves. It is better, therefore, to call it "Group" IV. Examination by Dr. Griffith of sputum from cases of lobar pneumonia has yielded the following results:—

Period of inquiry.	Total cases examined.	Percentage incidence of types.			
		Type I.	Type II.	Type III.	Group IV.
Apr., 1920–Jan., 1922.	150	30·6	32·6	6·6	30·0
Feb., 1922–Oct., 1924.	61	42·6	21·3	3·2	32·7
Nov. 1924–Mar., 1927.	67	34·3	7·4	4·4	53·7

In the third series the incidence of Type II. is unusually low and that of Group IV. is remarkably high. Apart from these two details the table illustrates the following important points, which are in agreement with the observations of other investigators: Types I. and II. are responsible for the majority of cases; Group IV. is the cause of a considerable number; Type III. is relatively infrequent in this disease.

Carriers.—A marked contrast is found when one comes to the types of pneumococci found in normal carriers. It is extremely rare to find Types I. or II., except in contacts with disease due to these types; Type III. is found with variable frequency; in the very large majority of cases the cocci belong to the heterogeneous Group IV.

With reference to the *relation of type to morbidity*, the Rockefeller report for 1917 gave the following figures, which refer to 100 cases of lobar pneumonia not treated with antiserum:—

		Incidence per cent.	Mortality per cent.
Type of Pneumococcus.	I.	33	25
	II.	31	32
	III.	12	45
	IV.	24	16

These figures are fairly representative, though the percentages, as regards both incidence and mortality, are liable to fluctuation from year to year.

Ætiological Significance of Type Characters.

The preceding data raise important questions with reference to the ætiological significance of type characters. Why are Types I. and II. responsible for

more than half the cases? It is obviously not owing to numerical preponderance, because they are the types which occur very rarely under normal conditions. Is it due to greater virulence? It must, in some way, be due to greater capacity for infection; but, when once the infection has set in, the mortality percentage is not markedly higher than that for which Type III., and Group IV., taken in conjunction, are responsible. Why is the incidence of Type III. so low, although it is not infrequent in the normal mouth, and why is its mortality-rate so high? Why is the incidence of Group IV. conspicuously low in relation to the frequency with which it is "carried," though its pathogenicity, as indicated by the mortality-rate, is fairly high? Dr. Griffith has made observations which are of assistance in dealing with these problems.

In the first place, he distinguishes between (1) capacities of the pneumococcus to survive in the air passages, (2) their invasive properties, and (3) their virulence as shown by the mortality-rate. With Types I. and II. (1) is low—i.e., they usually fail to grow in such situations as the mouth and nasopharynx; (2) is high—i.e., they tend to grow readily when they have gained entrance into the tissues; (3) is also fairly high. With Type III. (1) is high, (2) is low, and (3) is particularly high. With Group IV. (1) is high, (2) is low, and (3) is rather low. To this extent, then, serological differentiation of pneumococci may be correlated with differences in their behaviour as infective agents.

The Possibility of Changes in Type.

Do these distinctions imply that the pneumococcal types are fixed and unchangeable? If, as was the more customary belief until recently, types never change from one to another, it is not altogether easy to understand how the types perpetuate themselves.

On making numerous successive examinations of sputum from patients recovering from Type I. infection, Dr. Griffith finds that Type I. disappears and is replaced by Group IV. strains. There is the possibility that the patients were ordinarily carriers of Group IV. and became infected with Type I., which caused pneumonia; Group IV. was in abeyance during the disease, but reappeared on recovery. But there is also the possibility that Type I. did not die out, but became modified into Group IV. Further, if this change could occur, why not its counterpart? Might not Type I. have been derived from a Group IV. strain present before the onset of pneumonia?

The general question as to the possibility of change in type is thus of considerable interest to epidemiologists. On it depends the explanation of two features associated with lobar pneumonia; the disease is generally not epidemic but sporadic, and the individual patient appears frequently to have been infected autogenously and not from his surroundings.

Dr. Griffith has dealt with the problem by the experimental method. For the technical details, his article in the *Journal of Hygiene* (1928, xxvii., 113) must be consulted. In the report only a brief outline is given of the salient features of his work.

He has effected the following conversions: Type II. into Type I., Type I. into Type II., Type I. into Type III., Type II. into Type III., Group IV. into Type I., and Group IV. into Type II.

The steps which led to these important results are a good example of patient research. Dr. Griffith, whilst investigating the distinctions between "smooth" (S) and "rough" (R) forms of pneumococcal colonies, showed that the change into the R form was associated with loss of virulence; and he found that this change could readily be produced in any pneumococcal type by growing the S strain in its specific antiserum.*

The next step was to show that such R strains could have their virulence restored by inoculation of very large amounts into susceptible animals, and that this change was accompanied by reversion to the S form. It then occurred to him, as a possible explanation of the change, that the R culture contained traces of the S material which was associated with virulence, and that the R survivors picked this out from the mass of their dead companions, utilised it as food, and thereby reconstructed themselves into the S form. To test his hypothesis, he provided an abundant supply of this pabulum, in the form of S culture killed by heat, and injected this together with a small dose of living R strain. In this way he produced a condition of septicæmia from which the S form of pneumococcus was cultivated. Finally he found that the type of the virulent strain so produced was not necessarily the same as that from which the R strain had descended, but often had changed to the type of the killed S culture used as pabulum.

To sum up, the three conditions found requisite for conversion were: (1) The change could only be brought about in the animal body, not in vitro; his experiments were performed on mice. (2) The culture to be converted had first to be reduced to an intermediate phase of partial degradation—i.e., from S to R; this produced a certain loss of specific characters which was necessary before new specific characters could be acquired. (3) Along with the degraded culture, it was necessary to inoculate in the same site (the subcutaneous tissue of a mouse) some killed virulent, or S pneumococci. This dead material acted as a food-supply out of which the R strain could build up its new S organisation; or, perhaps, Dr. Griffith suggests, it also served to enhance virulence in the same way as an "aggressin." Can these three conditions, which were requisite for the experimental change, be regarded as representing conditions likely to produce a change of type in human infections? (1) The mouse is represented by the patient. (2) During convalescence, specific antibodies are present which may degrade an S into an R form, just in the same way as this process takes place by growth in immune serum. (3) In convalescence, also, there is a destruction of virulent pneumococci and some of this dead material may provide the pabulum out of which the R form builds up its new organisation. Modification of bacteria in the animal body always involves the interplay of two factors, the properties of the bacteria and the influence of the host. As regards the latter element, Dr. Griffith calls attention to the remarkable fact that the incidence of the chief types of pneumococci in lobar pneumonia is almost identical in countries where the climatic and social conditions are similar. There is evolution in the individual subject of special types most suited to set up pneumonia; and the similar distribution he explains as due "to similar composition of the population as regards susceptibility to the pneumococcus and not to similarity in the diffusion of pneumococcal types."

Adaptation of Bacteria to Environment.

On the part of the bacteria, he regards their various forms and types as expressions of vital adaptation to meet alterations in their environment. For example, in convalescence from Type I. pneumonia conditions are adverse to the infecting pneumococcus. But it does not die out completely; some cocci are able to assume the R form. This is not resented by the host, because the R cocci are harmless; it is also a means of self-preservation for the cocci, because, when in the R form, they are not susceptible to the host's specific Type I. antibodies. Not only may they survive in a degenerate condition, they may also reconstitute themselves into another S type (Group IV. or Type III.), possessing less invasive power than Type I., but increased capacity for resistance. As regards the exact conditions under which a pneumococcus may acquire Type I. or Type II. characters in the human air passages and thus become the causal agent of a lobar pneumonia, one can only speculate at present. Local tissue conditions can be imagined, constituting a nidus of infection in which the cycle of change illustrated in the mouse can be brought about.

(*To be continued.*)

* The significance of rough and smooth variations of bacteria, in so far as it is at present understood, was reviewed in THE LANCET, July 7th, p. 31.

THE PARIS HOSPITALS.—Mr. Loucheur, the Minister of Public Works, has proposed to the Prefect of the Seine that six new hospitals should be erected in the suburbs of Paris to relieve the congestion in the city institutions and to meet the needs of the neighbouring towns. The Minister expresses the opinion that each hospital should have 1500 beds, and that four should be begun without delay. He estimates the total cost at the equivalent of £2,000,000, of which the State will contribute £800,000.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

The New Department of Health for Scotland.

THE Secretary of State for Scotland has designated Mr. John Jeffrey, C.B.E., as the Permanent Secretary to the Department of Health for Scotland and he will probably take up his work towards the end of the year. Meanwhile, the Scottish Board of Health is reduced to two members, one of whom, though due to retire, is retained until the new Department is formally installed. Mr. Jeffrey, the new Permanent Secretary, who is at present Secretary of the Board, has had a long and very varied career in the civil service. He has done a large amount of detailed constructive work. He was secretary of the Macdougall Committee on Scottish Poor-law over 20 years ago, and later was for four years assistant secretary of the Royal Commission on Poor-law and Unemployment. In the recent rating reforms, he had the chief responsibility for the working out of the schemes and he has taken a leading part in preparing the groundwork of the revolution now going on in local government machinery. The appointment of the Chief Medical Officer, on whose relation to the Permanent Secretary, on the one hand, and to the Minister, on the other, the smooth working of the new administration will largely depend, has not yet been made. There is ground for believing that the Secretary of State is fully alive to the importance of maintaining the status of the medical officer of the department.

The Universities.

A year of "quiet progress, not marked by many notable events," in the life of Edinburgh University was surveyed by Sir J. Alfred Ewing, F.R.S., vice-chancellor and principal, at the autumn graduation in the Upper Library Hall on Oct. 20th. At the outset of his speech he referred to the changes in personnel. Prof. G. L. Gulland had retired from the chair of medicine and been succeeded by Prof. W. T. Ritchie. Sir James Walker had laid down his burden as professor of chemistry, and Prof. Kendall had been appointed in his stead. Prof. Sydney Smith had returned from the East to take the chair made vacant by the death of Harvey Littlejohn. During the year one new professorship had been established—that of animal genetics—and had been filled by the appointment of Dr. F. A. E. Crew. Buildings were about to be erected, to the designs of Sir Robert Lorimer, for housing that department, which, meanwhile, found temporary quarters in and about the chemical laboratory. Their cost would be met mainly by grants from the Development Commission and the International Education Board. The work had in fact begun, on a site near that on which Sir Robert Lorimer's new buildings for the department of zoology were approaching completion. These two departments would extend the group, collectively known as the King's Buildings, on the ample area adjoining West Mains-road, where chemistry had already found a permanent and geology a temporary home, and where other scientific departments would in due course be placed. Within the grounds of the Royal Infirmary the laboratory of clinical medicine, which they were able to provide through the generosity of the Rockefeller Trustees, had been built and was now ready for use. During the past year the number of matriculated students was 4349, or 210 more than in the previous year, and nearly 4000 more than it was two years ago. The increase was shared by all faculties except that of science, where there was a slight reduction. The whole number was made up of 3026 men and 1313 women. The faculty of arts alone had more than 2000, with an equal division of the sexes—1052 women to 1093 men. In medicine there were 139 women to 1093 men. A surprising recent phenomenon had been the multitude of applications that came from American students of medicine for admission to that University, after completing a first year of medical study at home. Fully 500 inquiries of that kind had been received since January. That was no doubt a compliment to Edinburgh, but an embarrassing one, for only a few of the applicants could be taken, having regard to the claims of others and to the limited number of places that were available in clinical parts of the curriculum. Room had, however, been found for a few, and they now had about 75 American students engaged in the study of medicine. The University of Aberdeen this session is able to welcome one of her distinguished sons, who has returned to his Alma Mater as professor of physiology. Prof. Low, Dean of the Medical Faculty, in introducing Prof. J. J. R. Macleod, F.R.S., said that he had had a brilliant undergraduate career as a student and was remembered as one of the envied few who possessed, as it were, a photographic memory. After graduating with honours, Dr. Macleod had spent a year of study in the Physiological Institute of Leipzig University. He then joined the staff of the Physiological Institute of the London Hospital Medical School. So quickly had he established a reputation as teacher and research worker that within three years he was invited to become professor of physiology in the Western Reserve University, Cleveland, being called to the University of Toronto in 1918. The whole world knew of his part in the dramatic discovery of insulin, for which jointly with Dr. Banting he had in 1923 been awarded the Nobel Prize for Medicine. Prof. Macleod's inaugural address was published in THE LANCET of Oct. 20th.

Emeritus Prof. W. C. McIntosh, F.R.S., has reached his ninetieth birthday, on which occasion the University of St. Andrews have sent him a congratulatory message. He became natural history professor in the University in 1882, and retired from the chair in 1917. For a considerable period he was a member of the Fishery Board for Scotland and much of his research work has been concerned with food fishes. A keen research worker, Prof. McIntosh still spends much time in the Gatty Marine Laboratory, St. Andrews.

Acute Poliomyelitis in Glasgow.

There has recently occurred an increase in the incidence of acute poliomyelitis in Glasgow. This dates from the beginning of July, since when there have been reported 86 cases in all, with seven deaths. During July there occurred 15 cases; during August, 19; during September, 27; and 25 up to Oct. 20th. The majority of patients are children under 5 years of age. A group of six cases have occurred among scholars of Anette-street School, the last patient sickening on Oct. 12th, since when there has been no further incidence. It is most unusual for a group of cases to occur in association with day schools, and all possible measures have been taken in association with the education authority to prevent any further spread of infection.

The Carntyne Housing Scheme.

Glasgow's newest suburb and the latest contribution by the municipality towards the better housing of the citizens was formally opened on Oct. 24th by Lady Gilmour, wife of the Secretary of State for Scotland. The area affected by this scheme is situated south of Riddrie, in the east end of the city, and part of it is divided by the new Glasgow-Edinburgh road. Covering 261 acres, of which 214 are within the city boundaries, the scheme includes the provision of some 2000 houses of various types, a large number of which are nearing completion.

Bovine Tuberculosis.

A conference is to be convened among the larger urban local authorities in Scotland on the subject of bovine tuberculosis. At a meeting of the Glasgow Corporation held on Oct. 5th this proposal was welcomed, in view of the report of the city veterinary inspector (Mr. A. M. Trotter). His report dealt with

the question of the eradication of bovine tuberculosis, and pointed out that if the disease could be eradicated from one herd, it could also be eradicated from every herd in the country if the hearty coöperation of the Government, stock-owners, and the veterinary profession to this end could be obtained. The question was one that required immediate attention, in view of the limited powers for dealing with diseased animals brought to the city markets. Although they were able to exercise control in their own markets, there was nothing to prevent outlying districts from sending tuberculous cattle for sale or slaughter.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

School Medical Services.

Mr. Richard Mulcahy, Minister for Local Government and Public Health, in an address to a political meeting last week, said that the organising of school medical services provided public health authorities with a vantage point of enormous value not only for the direct prevention and treatment of disease, but for the education of the individual. The modern public health movement had reached its third phase in recent legislation dealing with personal hygiene, the first stage having been principally characterised by the development of waterworks and sewage disposal systems, and the second stage by more effective control over contagious diseases. School medical inspection had been introduced in Great Britain in 1907, but it was not until 1919 that the Public Health Medical Treatment of Children (Ireland) Act imposed this duty on county and county borough councils.

Describing the organisation of school medical inspection in Dublin, Mr. Mulcahy said that out of 10,752 children examined in the city there were only 42 cases of non-pulmonary tuberculosis, 20 of definite pulmonary tuberculosis, and 18 of suspected pulmonary tuberculosis, being less than 0·8 per cent. of the children inspected. Rickets appeared to be almost non-existent where, because of poverty and other causes, much of it might have been expected. So also was personal uncleanliness. The principal defects were shown to be: dental caries, 5336 (or 46 per cent. of the children inspected); tonsils, adenoids, &c., 2248 (21 per cent.); eye defects, 2609 (24 per cent.); malnutrition, 594 (5·5 per cent.). He commenced by speaking of the steps that had been taken in other areas to establish schemes of inspection of school-children.

Insanity in the Irish Free State.

The annual report of the Inspectors of Mental Hospitals in the Irish Free State for 1927 states that the number of insane persons under care at the end of the year was 20,042. Of these 16,409 were in district mental hospitals, 425 in auxiliary mental hospitals, 1834 in poor-law institutions, 807 in private mental hospitals, 156 in single care, 115 in Dundrum Criminal Lunatic Asylum, and 296 in institutions for mental defectives. There was a net increase of 155 during the year. The proportion of insane in different areas varies greatly. It is highest in County Waterford, where the rate is 9·29 per 1000 of the population, and lowest in County Donegal, where it is only 4·56. The three lowest rates are found along the western seaboard, in the counties of Donegal, Mayo, and Kerry. The inspector suggests that the rates as given may be misleading, as they only reflect the proportion of insane under care, and not that of the total insane. He thinks that in the more rural counties there are many insane who never come under care. Although the number of insane continues to increase, there has been ever since 1922 a continuous decrease in the number of annual admissions. The total number of deaths during the year was 1069. Of these, pulmonary tuberculosis was responsible for 17·9 per cent., epilepsy for 3·4 per cent., malignant disease and other tumours (except of the brain), 2·7 per cent.; and general paralysis of the insane, 0·7 per cent. Enteric fever occurred during the year in nine mental hospitals, and caused 21 cases and 2 deaths in Ballinaslae, and 33 cases and 6 deaths in Mullingar. Dysentery caused 7 deaths, of which 5 occurred in Limerick. The average cost per patient in the district mental hospitals (deducting repayment of loans and other miscellaneous receipts from gross expenditure) was £44 4*s*. 2*d*.

Ulster Medical Society.

The opening meeting of the session was held in the Medical Institute, Belfast, on Oct. 25th. The outgoing President occupied the chair at the commencement of the proceedings and inducted to it Dr. T. H. Milroy, professor of physiology in the Queen's University of Belfast, investing him with the presidential chair and medallion. The newly installed President expressed the thanks of the Society to Dr. J. C. Rankin for his dignified conduct in the chair during the past session, and to him and Miss Rankin for their hospitality and kindness to its Fellows and Members; he then referred to the loss the Society has sustained during the year in the deaths of Dr. W. G. Mackenzie, Dr. J. S. Darling, Dr. T. A. Davidson, and Dr. H. L. M. McKisack.

Prof. Milroy's presidential address dealt with physico-chemical adjustments of the body, with particular reference to the blood. He showed how the properties of body tissues and fluids might be regarded as mainly due to the existence of colloids in various degrees of solution, and how the separation of these colloidal particles in a dispersion medium is bound up with the electrical configuration of the system, as illustrated by the behaviour of red cells, which are negatively charged, in isotonic electrolyte-free solution; if to such a suspension a trivalent anion such as lanthanum were added, the cells agglutinated and the sedimentation-rate increased, the molar concentration of the lanthanum required to neutralise being the measure of the negative charge of the cells. Adjustments between the red cells and the plasma were next considered, and the permeability of the red cell capsules compared with that of collodion membranes; it was shown that while red cells are normally permeable only to anions, permeability to kations might be experimentally produced. This anion permeability permitted the exchange of bicarbonate ions formed in the red cells with the chloride ions of the plasma. Attention was then directed to the part played by blood pigments in adjustments of the reaction of the blood; in the transformation of part of the oxyhæmoglobin to hæmoglobin, base was set free as hæmoglobin was a weaker acid than oxyhæmoglobin; the larger part of base was thus secured by the entering carbonic acid without any change in reaction. The adjustments in reaction brought about through variations in the activity of the respiratory centre, and by the removal of excess of fixed acid or base by the kidneys, was briefly dealt with, and compensated types of acidosis compared with uncompensated.

Mr. T. S. Kirk moved, and Dr. J. E. MacIlwaine seconded, a vote of thanks for the address.

MOTORISTS AND ACCIDENTS.—The Royal Automobile Club announces that it is endeavouring to secure subscriptions from clubs and individuals interested in motoring for the benefit of hospitals situated on or near main roads which have special calls upon their services in respect of motor accidents.

ORMSKIRK COTTAGE HOSPITAL.—Miss Margaret Beavan, Lord Mayor of Liverpool, has laid the foundation-stone of an extension of this institution. It includes a new children's ward, an enlarged men's ward, an anæsthetic room, a convalescent ward roofed with Vita glass, and modernised domestic and nursing quarters.

Public Health Services.

INVESTIGATION OF MATERNAL DEATHS.

AN OFFICIAL INQUIRY FORM.

THE Committee of the Ministry of Health on Maternal Mortality, of which Sir George Newman is chairman, has issued an inquiry form for the guidance of medical officers of health in making full investigation of every maternal death in childbirth. The suggestion is that a copy of this form with the accompanying explanatory note should be sent to each private practitioner in the district inviting his collaboration. All information given will be treated as strictly confidential and used whether by the medical officer or by the Ministry for public health and scientific purposes only; any mention of person, place, or institution which might lead to identification will be omitted in the report. It is assumed that the medical officer of health who makes the inquiry will not be engaged in private practice, and will be assisted by an obstetric specialist, or—should there be no such recognised in his district—by one or more practitioners nominated by the local division of the British Medical Association. When a parturient woman dies in hospital or other institution the authorities will be asked to furnish the necessary information. In private cases inquiry will include an interview between the practitioner and the medical investigator, any appearance of criticism being scrupulously avoided, for an accoucheur is already more than sufficiently harassed by the occurrence of a death in his practice. On the inside pages of the inquiry form are scheduled every common cause of maternal death, various questions under each heading being intended to suggest the appropriate lines of inquiry; and on the fourth page is space for comment by the medical investigator and by the practitioner in charge. The latter will be entitled if he wishes to see the findings of the medical investigator before the report is formulated finally for the Ministry. So far as this inquiry entails added expense the Ministry of Health is prepared to approve any reasonable expenditure, and the Ministry is desirous of having the reports submitted as soon as they are complete without waiting for the usual quarterly report of the department.

THE DORSET INSURANCE COMMITTEE INQUIRY.

NEARLY a year ago the Insurance Acts Committee took the unprecedented step of addressing to the Minister of Health, through the deputy medical secretary of the British Medical Association, a letter of protest and complaint against the treatment received by the Dorset insurance practitioners from the clerk to the Dorset Insurance Committee. The allegations in the letter were eventually investigated at a local inquiry held at Dorchester in the last days of June by Mr. Michael Heseltine. Towards the end of August his findings and recommendations were reported to the Ministry and these have lately reached us. The report is a lengthy document; it deals patiently with every issue raised during the proceedings.

A rather vague allegation in the deputy medical secretary's letter, to the effect that the clerk to the Dorset Insurance Committee had acted as informer, prosecutor, and, so far as possible, adjudicator, in medical service subcommittee cases, is held not to have been established. A point of more general importance had been raised by a resolution of the insurance committee a year ago recommending that any practitioner applying for admission to the medical list, or giving notice of change of address, should be asked to give details of the surgery and waiting-room accommodation he would provide. Section 24 (2) (*b*) of the National Health Insurance Act directs that the Medical Benefit Regulations are to require the adoption by every insurance committee of such a system as will secure to any duly qualified practitioner who is desirous of being included in the medical list the right to be so included. Mr. Heseltine observes that, if the Dorset Committee's resolution purported to impose an obligation on the practitioner, it would be contrary to law and unenforceable. Another matter of general interest was the disputed interpretation of the amount of discretion exerciseable by the chairman of the Medical Service Subcommittee in dealing with questions which stand referred to the subcommittee under paragraphs (1) and (2) of Article 28 of the Medical Benefit Regulations and also in dealing with cases which may be treated as questions standing referred under the article in accordance with paragraph (3) of Rule 6 of the Dorset Rules and Procedure for the Administration of Medical Benefit. Mr. Heseltine declares as a matter of law that the chairman has a reasonable measure of discretion in dealing with questions which must be investigated by the subcommittee under Article 28 because the category of cases in which the "statement or statements of the complainant do not disclose any prima facie ground of complaint" is sufficiently wide to enable the subcommittee to dispense with a hearing in cases of such a character that reasonable men would consider it proper to do so. The significance of this part of the proceedings was that the local practitioners considered—and the chairman himself apparently agreed—that his discretionary power of dispensing with hearings had been unreasonably restricted; Mr. Heseltine finds as a fact that this was so, and that the restriction was at any rate partly due to the clerk's failure to deal regularly and equitably with statements and communications addressed to the insurance committee by or on behalf of insured persons. Another issue raised at the Dorchester inquiry was this: If a practitioner charges a fee to an insured person and, having found that he has made a bona fide mistake, returns to the insured person the amount of the charge made, must the case go as a routine matter for hearing before the Medical Service Subcommittee in view of paragraph 7 (3) of the Terms of Service for Practitioners? To this question Mr. Heseltine's report replies that it is neither necessary nor proper that such a case should go to a hearing "as a routine matter." Finally, a personal, rather than a general matter, there had been considerable irritation among local insurance practitioners at the character of the clerk's correspondence with them, his letters being criticised as abrupt, irritating, and sometimes offensive. Here the finding is that the clerk's conduct in certain cases in this respect was unbecoming in an officer of a public body.

The findings and conclusions in the Dorset inquiry have been set out above in some detail partly for their general interest and partly because they justify the unusual action taken by the Dorset insurance practitioners in pressing for an inquiry. It will be the general wish that the controversy should now end. Assurances have been given, the report states, on behalf of the clerk to the Dorset Insurance Committee. The practitioners will be ready to forget the past and to do their utmost to ensure the smooth and efficient working of the health insurance system in the future.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED OCT. 20TH, 1928.

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 128 (last week, 162); scarlet fever, 2997 (last week, 2984); diphtheria, 1237; enteric fever, 52; pneumonia, 1136; puerperal fever, 62; puerperal pyrexia, 108; cerebro-spinal fever, 7; acute poliomyelitis, 14; acute polio-encephalitis, 1; encephalitis lethargica, 29; dysentery, 4; ophthalmia neonatorum, 102. No case of cholera, plague, or typhus fever was notified

during the week. There is little further increase in scarlet fever, and enteric fever continues to diminish.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Oct. 23rd–24th was as follows: Small-pox, under treatment 6, under observation 1; scarlet fever, 2583; diphtheria, 1747; enteric fever, 38; measles, 80; whooping-cough, 271; puerperal fever, 23 (plus 14 babies); encephalitis lethargica, 69; poliomyelitis, 2; "other diseases," 21. At St. Margaret's Hospital there were 10 babies (plus 4 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 3 (2) from enteric fever, 9 (0) from measles, 10 (2) from scarlet fever, 27 (7) from whooping-cough, 36 (5) from diphtheria, 102 (26) from diarrhœa and enteritis under two years, and 55 (6) from influenza. The figures in parentheses are those for London itself.

The fatal case of enteric fever outside London was reported from Ealing. (There was no death from small-pox in the returns received from the whole of England and Wales for the month of September last.) Three fatal cases of measles were reported from Liverpool, 2 of scarlet fever from Leicester, and 3 of whooping-cough from Sunderland, while West Ham, Manchester, Salford, and Leeds reported 2 each. The deaths from diarrhœa and enteritis under two years show no reduction; Liverpool still has 10 to report, Stoke-on-Trent and Birmingham 5 each, West Ham and Manchester 4 each.

The number of stillbirths registered during the week in the great towns was 265 (corresponding to a rate of 41 per 1000 births), including 42 in London.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1927 statistics of three large cities and a county borough.

Name of city or county borough and estimated (R.-G.) population.	Birth-rate.	Death-rates per 1000 of the population.				Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with Influenza.	Heart disease.	Infant and neonatal mortality.	Diarrhœa, &c., under 2 years.	Maternal mortality from childbirth.
Leicester .. .. (245,000)	16·2	12·4	1·46	1·47	2·0	1·6	77/37	8·7	4·0
Leeds .. .. .. (477,600)	16·3	13·0	1·17	1·36	2·2	2·1	81/35	11·3	4·9
Bradford .. .. (293,200)	14·7	14·6	1·00	1·53	3·4	1·4	94/36	7·6	6·7
Oldham .. .. (141,100)	14·6	14·4	0·89	1·55	3·5	1·6	86/48	6·7*	11·0

* Under 1 year only.

The pre-school mortality-rates per 1000 births were: Leicester, 39; Leeds, 47; Bradford, 50; Oldham, 36.

Leicester.

Dr. C. Killick Millard refers to the report issued by the Ministry of Health during 1927 as the outcome of an investigation by a departmental committee on the use made of the beds in isolation hospitals. It is there pointed out that under present conditions, and on general public health grounds, too many beds are being reserved for scarlet fever patients, and that some of this accommodation could be more profitably used for such ailments as measles, pneumonia, and infectious diseases of the nervous system. The Leicester Health Committee, after explaining the position to the medical profession in Leicester and inviting their coöperation, have effected a gradual reduction in the percentage of scarlet fever removals. The proportion of removals, which averaged about 61 per cent. before the new arrangement was adopted in September, was reduced to 45 per cent. for the last four months of 1927, and to 42 per cent. for the first quarter of 1928. Out of 620 scarlet fever notifications in 1927 there were only 3 fatal cases, indicating the mildness of the disease.

A cancer-control clinic is held on one evening a week at the health offices by the honorary surgeons of the Royal Infirmary. The clinic is not for treatment, but for diagnosis and advice only, and to begin with it is concerned with affections of the breast and uterus. A patient may be referred to her own doctor, advised to return for re-examination, or recommended for admission to the Royal Infirmary. Various methods have been adopted to advertise the clinic. Of 60 cases attending during the six months 36 were found not to be cancer and 5 were asked to return, 5 were referred to their own doctor, and one case went to a private hospital. Twelve cases were recommended to the Royal Infirmary, of whom 11 were admitted at once and one was dealt with as an out-patient. Of the infirmary cases, 3 were found to be cancer of the breast and operated on.

Charts are given showing the attendance of males and females at the venereal diseases clinics since 1917. In the case of males the new cases of gonorrhœa have always exceeded those of syphilis. The peak for both diseases was reached in 1919, and a second lesser peak is indicated in 1926. In the case of females syphilis cases have always exceeded gonorrhœa until the three years 1925–27. The peak for syphilis was reached in 1921 and the peak for gonorrhœa in 1926. Dr. Millard is not in the least satisfied with what we are doing to prevent these diseases and devotes considerable space to discussing the "tragedy of venereal disease." During 1927, of 354 new male patients with gonorrhœa 134 were married, and of 95 with syphilis 57 were married. He gives particulars of individual cases seen at the male and female clinics from which the most disastrous results can be inferred. No doubt he is right in thinking that the public do not appreciate these tragedies, and that publicity through the press and the distribution of copies of his report to the public libraries is much to be desired.

Dr. Millard refers to the great value of the municipal housing schemes and to progressive improvements as the result of experience. It is essential, he says, that the present housing policy should be continued long enough and not abandoned as soon as the more urgent demand is satisfied. The housing schemes raise the whole standard of housing for the working class, and enable the worst of the existing old houses to be closed, but they fail to help persons, who are unable to pay the rent fixed or who have such a large family that a corporation house cannot accept them, or who are undesirable on the ground of personal character. He accepts the position that corporation houses must entail as little charge on the rates as possible, that the housing committee cannot make a distinction in the rates charged to different tenants, and that they cannot jeopardise their new housing estates by lowering the standard as regards the character of their tenants. He suggests, however, that the Health Committee, apart from the Housing Committee, might have the letting and control of a certain number of corporation houses, which should be located quite apart from other corporation houses. The Health Committee, being specially concerned with the poorest stratum of the community, might differentiate between tenants. The Housing Committee naturally want good tenants, while the Health Committee want to assist those most in need of assistance as regards overcrowding. A further suggestion which he makes is that the Leicester Corporation might do much in the matter of reconditioning old houses. Hitherto it has done nothing.

Of the 298 infant deaths 148—i.e., half—occurred in the first month and 107 during the first week.

Success is claimed by Dr. Stanley Banks for the treatment of severe cases of diphtheria at the isolation hospital by the use of much larger doses of serum and its administration intravenously. This was described by Dr. Banks and Dr. G. McCracken in THE LANCET of July 7th, p. 4. The need for steps to be taken to prevent hospital wards being burdened with cases of bacterial diphtheria devoid of clinical signs of the disease is discussed, though Dr. Millard

thinks Leicester does not suffer as much as Birmingham or the M.A.B. hospitals in this respect.

Leeds.

Dr. J. Johnstone Jervis deplores the fall in the birth-rate, which was in 1927 the lowest ever recorded in the city's history. He has much to say against the birth control movement and in favour of large families. In discussing the housing question, however, he mentions that landlords will not accept large families as tenants, so it is to be hoped that he is able to persuade his corporation to give a preference to large families when allocating municipal houses. Since 1920 5280 houses have been built by the corporation and 5588 by private enterprise, but the list of applicants "shows very little sign of diminishing." "The poorer paid worker, of whom there is a considerable number, has not been catered for and still continues to occupy the low-rented inferior dwelling in the congested parts of the city and to crowd into houses already carrying more than their quota of occupants. It is in connexion with the housing of this class that the need to-day is most urgent." During the year some progress was made with the West-street unhealthy area, and it is hoped shortly to build houses on existing housing estates for the tenants evicted therefrom. This area only touches the fringe of the question, however, and there are many others almost as bad calling urgently for attention. The serving of notices for overcrowding is in very many instances entirely futile. At the end of the year the houses in the city numbered 121,620, of which 77,652 were back-to-back houses and 43,968 "through" houses. A table of the causes of death gives the somewhat surprising result that 3869 of the deaths occurred in the back-to-back houses and 2305 in the through houses. The first public washhouse in the city has just been opened and is a great boon, especially to the occupants of back-to-back houses. In the case of the older back-to-back houses the conveniences are trough closets and ash-pits at intervals down the street. Photographs are given showing that bedrooms may be situated over the conveniences and that the occupiers of the furthest off houses may have to walk 60 yards down the street before reaching their conveniences. The only solution appears to be the demolition of two houses in the middle of the block, so as to provide a yard for modern water-closets and ash-bins, in place of the old trough closets and ash-pits.

There is always a long list of cases awaiting admission to the Leeds General Infirmary, and a welcome addition to the hospital accommodation of the city is being made by opening the wards of the two poor-law hospitals for patients willing to pay the very moderate charges levied by the guardians. A full staff of consulting physicians, surgeons, and specialists will be available for the treatment of the patients. The maternity hospital, which last year admitted 1250 confinement cases, is to have its available beds increased to 100, and the new wards are in course of erection. In the tuberculosis scheme there has always been a shortage of beds for surgical tuberculosis. Plans are being prepared for the erection of a children's hospital with 200 beds on the Elmet Hall Estate. which will provide not only for surgical tuberculosis, but for other orthopædic treatment and the nutritional disorders of infants. Another interesting development in the tuberculosis scheme is the taking over by the corporation of the "Factory-in-the-Field" started by the Tuberculous Ex-Service Men's Society. This will afford much needed facilities for offering men and women, disabled by pulmonary tuberculosis, remunerative employment of a suitable kind under the best conditions.

A table shows the increase in deaths from street accidents. In 1911 and 1912 there were 17 and 14 respectively, while in 1926 and 1927 there were 62 and 57. Over 90 per cent. of last year's accidents were due to motor vehicles, and the greatest increase appears to be at the age-periods 45 to 65.

Dr. Jervis thinks there has been a further decrease in the smoke pollution of the atmosphere. This may be partly due to bad trade, but chiefly to improved stoking, the substitution of electric for steam power, and the extended use of smokeless domestic appliances. The West Riding Regional Committee has directed its attention during the year to the drafting of by-laws defining black smoke, dense smoke, and standards for smoke emission; to the introduction of smokeless appliances for cooking and heating in new buildings, and to the issue of certificates to engineers and stokers who have passed certain tests.

There are no producers of graded milk from tuberculin-tested cows. The average cow population of the city is 2188, and among them 19 tuberculous animals were found, 4 with tuberculosis of the udder, 6 with emaciation, and 9 otherwise affected. There were 59 cases of small-pox with no deaths. Ten of the cases occurred among the 4000 employees of a clothing factory. In the first case the patient had been actually at work when in the eruptive stage and with an output of 3000 suits per day it was impossible to say which garments had been handled by infected persons. There is some evidence, however, that the final steam pressing and ironing has considerable disinfecting power, the Hoffman steam press used for the cheaper garments being more efficacious in this respect than hand pressing by hot irons used for the better-class clothing. Dr. Jervis records an increase in the gonorrhœa cases attending the venereal diseases clinics, which he mentions has been observed all over the country. Coincidentally there was an increase in the notifications of ophthalmia neonatorum, 86 cases in 1927 as compared with 73 in 1926 and 50 in 1925. Dr. Jervis emphasises the need for a closer liaison in Leeds between the antenatal clinics and the V.D. clinics, so that pregnant women may secure treatment. Of the 86 cases notified in 1927, 5 of the babies died, and of the 81 survivors 4 had the sight of both eyes affected, while 2 made an imperfect and 75 a perfect recovery.

Bradford.

Dr. J. J. Buchan reports that there is much serious overcrowding, and that at the end of the year the number of applicants for new houses was approximately 2784, 658 of whom were living in apartments. During 1926 2193 new houses were erected and during 1927 2029. During 1927 1115 new municipal houses were occupied and at the close of the year 988 were in course of erection. Some progress was made during the year in demolishing buildings and clearing the site for the "White Abbey" improvement scheme. Under the Bradford Corporation Act, 1925, power is given for the compulsory removal of persons physically unable to look after their homes and this power was used in the case of an enfeebled woman of 75 years. There was a considerable increase in the work of the dental scheme as compared with previous years.

The city cows numbering 3238 undergo regular veterinary inspection and among them 16 tuberculous cows were found, of which 5 were affected with tuberculosis of the udder. The bacteriologist's report shows that 373 samples of milk were examined for tubercle and 6·4 per cent. were found to be infected. It is pointed out, however, that some of the samples were duplicated and that no definite conclusion should be drawn as to the prevalence of tuberculous infection in the milk-supply. The examination of samples of shell-fish showed that "the majority of mussels and cockles are heavily polluted," and the examination of samples of ice-cream indicated that "further control of this industry is highly desirable in the interests of public health." On the other hand, 18 samples of watercress from ten sources were all reported as "good."

Diphtheria was more prevalent than in 1926. There were 340 cases with 35 deaths—a fatality-rate of 10·3 per cent. The Schick test is not employed in the city. There were 51 notifications of small-pox with no deaths. Efforts to prevent the spread of infection were hampered by the refusal of the majority of contacts to submit to vaccination. A chart shows that the male death-rate from pulmonary tuberculosis

is always much higher than the female and was almost double in 1927.

The Bradford Corporation have powers under a local Act of 1925 for compulsory notification of venereal diseases and it is believed that these powers have not deterred persons from seeking treatment, but have operated rather in securing better treatment. The records of 1927 point to a decrease in syphilis and an increase in gonorrhœa. During 1927, with the full coöperation of the medical profession, arrangements were made for the supervision and following up of all cases of malignant or suspected malignant tumour. Midwives attended about 74 per cent. of the births and sent for medical help in 15 per cent. of their cases.

Oldham.

Dr. James B. Wilkinson reports that the orthopædic institute, generously presented by Mr. R. Greenhalgh, has done good work, especially in the light treatment of rickets. Two ladies have presented to the town a large house, which was used as a hospital during the war and which is now fitted up as a first-class nursing home. Another large house has been purchased for adaptation as a much needed municipal maternity home with 12 to 14 beds, and will shortly be ready to receive patients. During the year the scheme for the substitution of sanitary bins for ash-pits was completed. A good deal of trouble is caused by the blockage of waste water-closets, which number 24,780. At the last census there were 34,781 houses and 34,755 families or separate occupiers. The houses let in lodgings and furnished rooms are being gradually reduced in number. An unhealthy area, which is at present being dealt with, consists very largely of this type of house, and as the houses are closed the tenants are offered accommodation on the new housing site at Greenacres. Dr. Wilkinson states that in the majority of cases these tenants are trying to live up to the improved standards which their surroundings allow. Antenatal work is as yet on a small scale, the centre being attended by 104 cases, while the births numbered 2095. The stillbirths notified numbered 134, equivalent to 6·4 per cent. of the live births—a high percentage. There was a decline in the new cases of syphilis and an increase in the new cases of gonorrhœa at the V.D. clinics. There were 19 cases of small-pox in connexion with a poor-law institution. Most of the cases were in men over 60 and of a mild type, but one death of a man of 62 was attributed to the disease. Dr. Wilkinson puts forward what he calls the heretical suggestion that, in view of the enormous expense at present undertaken and of the mild type of the disease, this ailment might be treated like chicken-pox. The cases would be isolated at home and people would have the choice of escaping the disease by vaccination or of contracting it.

EAST SUFFOLK AND IPSWICH HOSPITAL.—A new pathological department was opened by Princess Mary (Viscountess Lascelles) on Oct. 20th. The site upon which the new block is erected is at the north-east corner of the hospital property. The laboratory actually stands on the site of the stables and the coach-houses of Waveney House—the house which has been reconstructed and adapted as a residence for the pathologist. The ground floor is devoted to a museum for pathological specimens, a consulting-room, a waiting-room for patients, lavatories for the staff and for patients, and a store-room. There are also outside offices and accommodation for carrying on serological and inoculation investigations. The first floor is divided into five rooms and offices. The general laboratory—a room measuring 30 feet by 18 feet—is so constructed as to obtain cross light and ventilation; a portion of the room partitioned off in plate glass will be used as a vaccine preparation room. Autoclave and sterilising rooms are provided adjoining the section cutting department. A biochemical laboratory and a dark room specially fitted for photographic work in connexion with the pathological specimens complete the block. Dr. Eric Biddle, who is in charge of the department, has been granted a sum sufficient to enable him to instal modern apparatus of the best workmanship, and it is considered that the equipment will enable the laboratory to deal with all the work which may be reasonably required, not only by the hospital itself but by private practitioners and local authorities in the area served by the hospital.

Correspondence.

"Audi alteram partem."

VACCINATION REFORM.

To the Editor of THE LANCET.

SIR,—The whole argument in Dr. Carr's able letter in your last issue is vitiated by his continued refusal to face the probability of the future reintroduction of severe small-pox into this country, or the reversion of the present mild to a severe type, as I showed in my last letter, has repeatedly occurred recently in America, although he admits the possibility of these occurrences. He is also wise in admitting the very slight danger of vaccination, for this was also proved by the recent Rolleston Committee Report in which it was shown (1) that after a minute inquiry into the allegations of the antivaccinists the Royal Commission on Vaccination of 1889–96 concluded, regarding the ill-effects of the measure, "when considered in relation to the extent of vaccination work done they are insignificant"; (2) the very few deaths following, but by no means necessarily due to, vaccination have been reduced in recent years to one-third of the former "insignificant" rate; and (3) the nervous sequelæ Dr. Carr deplores nearly all occur in primary vaccinations *after infancy*, so are mainly due to the neglect of primary infantile vaccination, and an argument in favour of increasing, not decreasing, the relatively safe and more convenient vaccination during the first year of life. If we are to abandon every advance in medical science, including vaccination, because it is occasionally attended by ill-results, we shall have to revert to the safe, if vain, uncivilised method of wearing charms as a protection against disease and death.

I welcome Dr. Carr's mention of the "mild" small-pox outbreak in Gloucester in 1923, as it enables me to point out that with upwards of 500 patients each "mild" case cost the city £200, and the loss of local trade was estimated at £20,000 a week. With between 10,000 and 15,000 cases yearly during the last three years in England and Wales the total preventable waste of public money must amount to a far larger sum than the country can afford. As Dr. Carr admits that isolation and vaccination of contacts, through a costly agency not required in well-vaccinated Germany, is necessary to control each "mild" small-pox, this burden will increase greatly with the further neglect of primary vaccination he advocates. I showed early this year that the disease has increased 66-fold in six years in this country, and last winter three times as many counties were affected as in the previous year, while the last two weeks' returns show an ominous commencement of the usual winter rise with an increase from 94 to 162 cases; so with the continued spread of the disease, most people will have to be vaccinated sooner or later, and some employers of labour have recently found to their cost that the only insurance against serious business losses due to "mild" small-pox is to employ only vaccinated persons. Is it not, therefore, wiser to close the stable door before the horse is stolen?

Lastly, the interesting suggestion of the Rolleston report to use the milder American multiple puncture method of vaccination will doubtless receive the careful consideration of the public health authorities, although its weak point is that we do not yet know for how long it affords protection, but it does indicate the right solution of the problem. This in my humble opinion is not to bank on Dr. Carr's assurance that we have nothing to fear in future from severe small-pox in this country, and consequently we should at once throw away our one sure weapon against this relentless foe, just because at the present time his attacks are individually much weakened, although he is numerically far stronger. On the contrary, I

confidently submit to the medical profession the policy of maintaining unimpaired our well-tried defences of primary infantile vaccination, supplemented during small-pox outbreaks by revaccination; and at the same time press forward the researches of the scientific workers of the Rolleston Committee with a view to eliminating any remaining inconveniences and ill-effects of primary vaccination. For my own part I am content to leave it at that.

I am, Sir, yours faithfully,

LEONARD ROGERS, Lt.-Col. I.M.S. (Retd.).

South Hampstead, N.W., Oct. 28th, 1928.

HEART FAILURE IN BERI-BERI.

To the Editor of THE LANCET.

SIR,—This is to thank you for publishing Prof. K. F. Wenckebach's lecture on Heart and Circulation in a Tropical Avitaminosis (Beri-beri) in your issue of August 11th last. By the practical method of "trial and error" I have found that, as a result of treating some hundreds of cases, heart stimulation with digitalis is worse than useless in cases of beri-beri. Though beri-beri is most common among eaters of polished rice, one of the worst cases treated was a European who lived for over a month on tinned food whilst on a surveying journey. The water-retention hypothesis is strongly borne out by the fact that large doses of magnesium sulphate given daily are very beneficial to beri-beri patients. This in conjunction with ordinary yeast as used by most cooks in the tropics for breadmaking, in one ounce doses three times a day, and a diet including green peas (*katjang idjoe*) mixed with the rice, and other foods containing vitamin B, such as marmite, will render a beri-beri case physically fit for work within three weeks. To deprive a Chinese of rice makes him miserable, but if "katjang" is mixed with it he is contented. Where freshly made yeast is not obtainable, dry yeast spores in the form of pills may be given with benefit, up to about grs. 30 daily.

Till this form of treatment was adopted beri-beri cases often remained in hospital for two or three months, instead of the two or three weeks now required. A dynamometer is useful as an index of progress. On admission a beri-beri patient usually cannot exceed a grip pressure of 30 kg., and at the end of a fortnight under yeast treatment from 60 to 80 kg. may usually be registered.

I am, Sir, yours faithfully,

A. S. TUXFORD.

Central Hospital, Lahad Datu, B. N. Borneo, Sept. 19th, 1928.

"HYPERVITAMINOSIS."

To the Editor of THE LANCET.

SIR,—The letter of Mr. L. J. Harris and Mr. T. Moore in your last issue and your annotation of the previous week (p. 827) seem to me to raise questions of some practical as well as scientific importance.

From some work which has been carried out in this laboratory, it appears that the deleterious influence of irradiated ergosterol in excessive doses is not entirely due to vitamin D itself, since the toxic effect is not proportional to the antirachitic activity.

In these experiments, some of which are still in process, I find that young rats given a complete synthetic diet similar to that described by Drummond and Watson (*Analyst*, June, 1922) in which is incorporated ergosterol, *irradiated in a non-volatile solvent*, to the extent of 0·1 per cent. fail to grow, and die after about two months; similar results are obtained with 0·05 per cent., but 0·025 per cent. permits of almost normal growth. Older, but still growing, rats also respond to the diet containing 0·1 per cent. with cessation of growth. Incorporation of 0·1 per cent. non-irradiated ergosterol does not delay growth, or only to a slight extent. These results in general confirm those obtained by Mr. Harris and Mr. Moore. With 0·025 per cent. irradiated ergosterol present in the diet the number of antirachitic "units" (K. H. Coward, *Quart. Jour. Pharmacy*, 1928, i., 27) supplied per 100 g. diet, as determined by separate experiments, is about 200,000. The amount of vitamin D consumed per diem is, therefore, about 10,000 times greater than that necessary to prevent rickets in this animal.

In contrast to the relative harmlessness of these large doses of this material, it has been found that ergosterol, irradiated under different conditions and necessarily submitted to further manipulation, may have much greater deleterious effects, although the antirachitic activity may be less than one-twentieth of that of the irradiated ergosterol used in the other series of experiments. Young rats on such a diet die within a week or so; older rats show a marked loss of weight, from which, however, recovery can ensue if the intake of the excessive amount of ergosterol be stopped.

Two inferences may be drawn, in my opinion, from the work published on D-hypervitaminosis: first, that preparations containing this vitamin should be standardised in terms of some stable standard preparation, such as that used by Dr. Coward (loc. cit.); and, secondly, that the deleterious effects described are produced by doses so enormous that the clinician need not fear the production of toxic effects from the administration of therapeutic doses of ergosterol properly irradiated. After all, many articles of diet are injurious when taken in excess; usually from the mere nature of the foodstuff it is impossible to consume more than a slight excess, and it is only with the concentration of essential elements in highly active forms that any danger of over-consumption can arise; but it would seem to be about as wise to restrict the use of irradiated ergosterol from fear of harmful effects as to give up the use of common salt because of its unpleasant effects when taken in excess.

Accurate standardisation of vitamin D activity, of course, will prevent not only the administration of too large a dose in error, but also that of too small a dose with the resulting failure of therapeutic effect.

I am, Sir, yours faithfully,

S. W. F. UNDERHILL, M.A., B.M., B.Ch.,
Director, Physiological Laboratories,
The British Drug Houses Limited.

London, N., Oct. 30th, 1928.

TESTING FOR COLOUR-BLINDNESS.

To the Editor of THE LANCET.

SIR,—I have been greatly annoyed to find my name on caricatures of my lantern. One lantern had actually a yellow glass labelled purple. All authorised lanterns are accompanied by a certificate signed by me stating that they are correct. I understand that a number of unauthorised "Edridge-Green lanterns" are being used in India.

Indian papers please copy.

I am, Sir, yours faithfully,

F. W. EDRIDGE-GREEN.

Walm-lane, Willesden-green, N.W., Oct. 28th, 1928.

WELFARE WORK AND THE PRACTITIONER

To the Editor of THE LANCET.

SIR,—In reply to your correspondents "Algy" and "C. D." may I submit that in a school medical service and in an infant welfare service respectively, controlled by a common-sense perspective, the circumstances described in these two letters could not arise.—I am, Sir, yours faithfully,

R. J. MAULE HORNE,
Medical Officer of Health, School Medical Officer
M.O. in charge Child Welfare,
Poole, Dorset.

Oct. 27th, 1928.

Obituary.

SIR CHARLES SISSMORE TOMES, L.D.S., F.R.C.S. ENG., LL.D., F.R.S.

THE death of Sir Charles Tomes, which took place at Aylsham, Norfolk, on Oct. 24th, closes a period of more than three-quarters of a century during which the name of Tomes has been honoured by dental practitioners, not only in this country, but the world over. Sir John Tomes, who commenced the study of dentistry as a pupil of T. Fairley Smith nearly a hundred years ago, was one of the founders of modern dentistry, and the names of Tomes, father and son, will stand along with that of Pierre Fauchard in the dental surgeons' roll of honour.

Charles Sissmore Tomes was born in London on June 6th, 1846, and went to school at Radley, where he distinguished himself at rowing as well as in other ways. Following in his father's footsteps he entered Christ Church, Oxford, as a commoner, and in 1866 took the only first-class of his year in the Natural Science School. From Oxford he went on to the Middlesex Hospital where his father was then surgeon-dentist, qualifying M.R.C.S. and L.D.S. in 1869. At that time histology was practically a new subject and inspired by Charles Robertson, his Oxford teacher, Tomes began to devote his spare time to research, chiefly histological, the results of which, published for the most part in the Philosophical Transactions, led to his being elected a Fellow of the Royal Society at the early age of 32. It was in the same critical spirit that he approached problems more intimately connected with his daily work, and his observations and laboratory experiments disclosed facts of great value which are to be found recorded in dental journals, sometimes as papers, more often as contributions to discussions. Other workers sought his help and his work proved an incentive to such followers as the late Howard Mummery. Tomes was early appointed lecturer on dental anatomy to the (Royal) Dental Hospital of London, and his lectures were embodied in a Manual of Dental Anatomy which passed through many editions and was for long a standard work. He examined in dental surgery at the College of Surgeons for 14 years.

SIR CHARLES TOMES, F.R.S.

For many years Charles Tomes practised as a surgeon-dentist in Cavendish-square, at first with his father and later with Mr. E. G. Betts and Sir Harry Baldwin. Although too fully occupied to take an active part in political matters, his opinion was often sought concerning them. His mind was indeed more fitted to the giving of considered judgments—often of great value—than to taking part in public discussion, although he was keenly interested in all that concerned the welfare of his profession, and presided for a time over the British Dental Association. His appointment in 1898 to the General Medical Council, as a Crown nominee, was very welcome to his fellow practitioners who previously were unrepresented on the Council, though subject to its jurisdiction. He gained the confidence and friendship of members of the Council and was elected a treasurer in 1904, holding this office until his resignation from the Council in 1920, having been granted a knighthood the year previously. During his period of office the Council moved from the old offices in Oxford-street to its own building in Hallam-street, a change involving financial responsibility which fell largely on the Council's treasurer. Tomes also served as chairman of the Dental Committee. The knowledge gained from this work was of great value to the Dentists Act Committee appointed by the Privy Council to consider what changes, if any, were desirable in the Dentists Act of 1878, the report of which Committee led to the Dentists Act of 1921.

During the war Sir Charles Tomes served as chairman of the Norfolk and Norwich Hospital and inspected for the Norfolk Red Cross. After his retirement to Norfolk at the early age of 50 he continued his scientific studies until a heart attack two years ago limited his activities. He bore without complaining the loss of an eye through accident.

We are indebted to Sir Harry Baldwin for a very interesting series of personal recollections of his friend and partner, of which the following is an extract:—

My first sight of him, Sir Harry writes, as he walked into the theatre to give his 8 A.M. lecture at the Dental Hospital, remains sharply defined in my memory; the tall, athletic figure, the striking face, the head pushed forward, the beard hanging free. I was a young student then; he was 35. His lectures on his favourite subject—dental anatomy, human and comparative—were always fully attended and listened to with the greatest attention. Before coming to London as a dental student I had made some acquaintance with the literary works of both John and Charles Tomes and was impressed by their consummate literary style, and formed the conclusion early that the two men were the leading lights of the profession I was to follow. Imagine my delight when two years later the Dean informed me that Mr. Charles Tomes desired me to join him in practice. His practice was large and chiefly of a very distinguished class. For nine and a half months of the year he slaved from morning till night with a bare half-hour's interval for lunch, and often I returned after dinner to find him pursuing some problem of practical operative work, indulging his artistic abilities by enamelling some jewellery of his own making, or fashioning a silver plaque. His eye for form and colour and his love of art enabled him to paint and sketch exceedingly well, and on several occasions his works were hanging very near the line in the Royal Academy and other London exhibitions. In both oil and water-colour he was equally successful. His many-sided mind enabled him to practise good music and to read it at sight. He used to get much pleasure out of part-singing and sang regularly as a member of the Moray Minstrels. His other recreations included boat-sailing single-handed, fly-fishing, shooting, billiards, and whist. He was a great lover of animals; he often paid visits to the Gardens (he was vice-president of the Zoological Society), and at one time performed autopsies on all the animals whose bodies he could secure. He was on very good terms with many of these during life, particularly the less harmful snakes who loved to explore his pockets. He was devoted to his own dogs, particularly Irish Setters, of which he had some fine specimens. I remember him nursing almost continuously for several days and nights a favourite hound.

Charles Tomes not only possessed a brilliant intellect but his mind was absolutely just and honourable. He was rather shy and retiring, with no desire for self-advertisement and with a positive repulsion to anything savouring of sentimentality or affectation. Whenever he purposed to make any change which might affect the interests of his

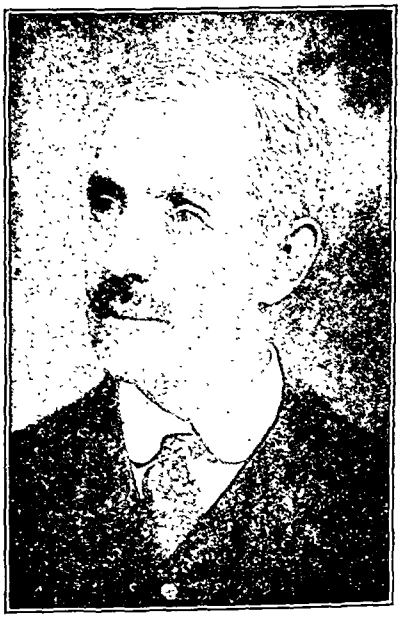
subordinates he would call them together and lay his plans before them prior to taking action. His breadth of vision, wisdom, and impartiality caused him often to be approached by fellow practitioners for help and guidance chiefly in settling difficulties with their colleagues, and his view of the case was, I believe, always ungrudgingly accepted as final. When questions arose concerning partnership or problems of an actuarial nature he never seemed obliged to refer to experts but simply and easily worked out the figures himself. It was this mathematical side of his intellect coupled with his breadth of judgment which was no doubt the reason for his appointment as treasurer to the General Medical Council soon after taking his seat in the Council Chamber.

His likeness to his father in mind and body was very remarkable. They had the same dignity of mind and character, the same powerful intellects and broad interests, the same devotion to science. Charles was taller and physically stronger than his father, but in later life the facial resemblance grew to be most striking. John began his work at a time when nothing had been done to build up and associate practitioners of dentistry into an organised and liberal profession. He had to forge his own position and that of his profession out of almost nothing, whereas Charles was born into a position carrying great prestige, received an exceptionally splendid education, and was backed by adequate funds. Father and son were a monumental pair. We shall never see their like again.

Sir Charles Tomes married in 1873 a daughter of Dr. Charles Cook, of Brooklyn, U.S.A., who survives him with a daughter.

LOUIS LAWRENCE CASSIDY, M.B. EDIN., F.R.C.S. IREL.

THE sudden death of Mr. Louis Cassidy last Saturday, as the result of a hunting accident, is deeply regretted throughout the profession in Dublin. He was 51 years of age, and was within a few weeks of completing his term of seven years as Master of the Coombe Hospital.



LOUIS LAWRENCE CASSIDY.

Louis Cassidy was born at Enniskillen, Co. Fermanagh, and in early life went to sea. After making his way to his master's certificate he abandoned the mercantile marine and began the study of medicine at the University of Edinburgh. Taking his medical degree in 1908 he came to Dublin as assistant to Prof. A. C. Geddes, who was at that time professor of anatomy in the school of the Royal College of Surgeons in Ireland. Cassidy proceeded to the Fellowship of the College in 1911, and decided to devote himself to the specialty of midwifery, being appointed Assistant Master of the Coombe Hospital. His work in Dublin was interrupted by the outbreak of the war. He joined the Royal Army Medical Corps and was posted to the Salonika Expedition, with which he spent some three years. On his return to Dublin he resumed work at his specialty, and in November, 1921, was elected Master of the Coombe Hospital. He also held the post of gynæcologist to the Royal City of Dublin Hospital, and had been for a time gynæcologist to Dr. Steevens' Hospital. He took an active part in the work of the Royal Academy of Medicine in Ireland, of which he was honorary secretary for foreign correspondence. He had also been for a term President of the Section of Obstetrics and Gynæcology.

Mr. Cassidy had studied much in continental clinics, chiefly at Vienna, and he did all he could to bring the Dublin School into touch with European progress. On his initiative a number of teachers from the continent gave courses of lectures in Dublin on several occasions. He worked hard to get endorsement for medical research in Ireland, and he was one of the principal movers in inaugurating the National Cancer Campaign (Ireland), to which he acted as honorary secretary. As Master of the Coombe he organised, in 1926, the Congress of Gynæcology, which marked the centenary celebrations of that hospital. Energetic in many movements for the advance of scientific medicine, Cassidy was content to work and move others to work without ever seeking publicity. In charitable causes he was as active as in scientific work, and few guessed the extent of his private generosity.

Of his service in Egypt and Macedonia during the war, Dr. W. G. Willoughby writes as follows: "Although a distinguished gynæcologist he with characteristic versatility became an enthusiastic sanitary officer in Macedonia, and did excellent work in the prevention of malaria. I have a photograph showing him with his Turkish labour detachment clearing a mosquito-infested stream. In helmet, shirt, and shorts, in a shade temperature of over 100° F., I found him as usual cheery and keen and regarded with affection by his men whether British or Balkans. The staff of the 31st Casualty Clearing Station at Janes will never forget his abilities as mess secretary of the C.C.S., especially in 'foraging.' In Mr. Cassidy we have lost not only a clever man but a charming companion and one of the most popular officers of the Twelfth Army Corps in Macedonia."

Mr. Cassidy leaves a widow with a son and daughter.

DUCHESS OF YORK MATERNITY CENTRE.—This centre was opened some three years ago in premises at 434, Essex-road, N., and it has become so popular with the mothers of the district that additional accommodation has been found necessary. On Oct. 29th a meeting was held at the centre, under the chairmanship of Lord Riddell, when an extension to the premises was declared open by Lady Lovat. A medical officer, a dispenser-chauffeuse, a nurse, and three students live at the centre; the patients attend for antenatal care, and their confinements are conducted in their own homes by the students, the doctor and nurse paying as many visits as are considered desirable. At the opening ceremony Miss Gertrude Tuckwell and Prof. A. Louise McIlroy spoke. The former alluded to the unanimity expressed by practitioners as to the importance of antenatal supervision in the task of reducing maternal mortality and morbidity, and said that a series of clinics similar to this centre, spread over the country, would be a factor in preserving maternal life and health. Prof. McIlroy explained that the clinic, which was run in connexion with the Royal Free Hospital, was entirely devoted to maternal and gynæcological work, and not in any way connected with treatment of venereal disease. The women were encouraged to come as early in their pregnancy as possible, and were thoroughly overhauled. If any treatment was found to be necessary they were referred to their own doctor, or to the nearest treatment clinic, or sent to the Royal Free Hospital. A dental clinic had been established, and no less than 75 per cent. of the women attended it. Every patient was seen about a fortnight after delivery, and was advised to take her baby to one of the welfare centres in Islington; she was given a card with the history of her case to show the medical officer. An evening clinic was held at the centre for girls suffering from gynæcological conditions whose work made it difficult for them to attend hospital in the daytime. At this clinic any of the mothers requiring attention after confinement were also treated. There had been no maternal death among more than 500 patients cared for last year.

Medical News.

UNIVERSITY OF CAMBRIDGE.—At a congregation on Oct. 27th the following degrees were conferred:—

M.D.—H. F. Brewer and Harold Wacher.

M.B., B.Chir.—R. M Gilchrist, W. R. Ashby, and J. W. Monro.

The *Pinsent-Darwin Studentship in Mental Pathology* was founded in 1924 by the benefaction of Mrs. Pinsent and Sir Horace and Lady Darwin for the purpose of promoting research into any problem which may have a bearing on mental defects, diseases, or disorders. It is of the annual value of about £200 and is tenable for three years in the first instance. The student may be of either sex and need not be a member of the University of Cambridge. He shall engage in original research in Cambridge or elsewhere but may, subject to the consent of the managers, carry on educational or other work concurrently. Further particulars of the studentship may be obtained from the Registrary of the University of Cambridge, and applications for appointment to the studentship should be made in proper form before Dec. 1st, 1928.

UNIVERSITY OF LONDON.—At a meeting of the Senate held on Oct. 24th Mr. Geoffrey Duveen's offer to make a further donation for the Travelling Studentship in Oto-Rhino-Laryngology was accepted with thanks, and regulations for the award of the studentship were adopted.

The Laura de Saliceto Studentship, of the value of £150, was awarded for 1929 to Mr. A. F. Watson, Ph.D., for the purpose of continuing investigations on a detailed study of dietary and other factors contributing to the genesis and development of experimentally induced tumours in animals.

University College Hospital.—Three lectures, illustrated by lantern slides, will be given by Dr. Charles Singer at University College Hospital Medical School, Gower-street, on Mondays, Nov. 12th, 19th, and 26th, at 4.15 P.M. The subjects will be diphtheria, small-pox, and plague respectively. The lectures will be open to all medical students of the University.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—An ordinary meeting of the College was held on Oct. 25th, with the President, Sir John Rose Bradford, in the chair.

Dr. William Willis Dalziel Thomson was admitted to the Fellowship in absentia.

The following were elected Members:—

Mahomed Abdul Hamid, Samuel Berman, Bir Bhan Bhatia, Harold Livingstone Coulthard, William Hofmeyr Craib, Richard Desmond Curran, Wilfred Evans, Thomas Norman Fisher, Wilfred Fletcher Gaisford, Hugh Walker Gordon, Bruce Atlee Hunt, Samuel Levy Simpson, John Kirkpatrick Monro, Oswald Ellis Joseph Murphy, Frank Bett Parsons, Alan Meredith Richards, Thomas Frederick McNair Scott, Frederick Horace Smirk, Allan William Spence, Bernard Clive Tate, William Rayner Thrower, and Harold Frederick Wilson.

Licences to practise were conferred upon 159 candidates (including 10 women) who have passed the Final Examination in Medicine, Surgery, and Midwifery of the Conjoint Board, and have complied with the by-laws of the College. The following are the names and medical schools of the successful candidates:—

A. G. Adrian, Cape and St. Mary's; W. H. Allan, Guy's; V. E. N. Allen, Bristol; T. C. Baker, Cape and St. Mary's; G. N. Beeston, Charing Cross; W. A. Bellamy, St. Bart.'s; George Bellman, St. George's; W. L. M. Bigby and J. B. Blakley, Guy's; C. V. Bloom, London; K. C. Blyth, Sheffield and London; B. J. Bouché, Madras and Guy's; M. T. Brockman, J. D. Cambrook, and F. E. Camps, Guy's; Mohammed Sobhi Chafey, Cairo and Charing Cross; Benjamin Cimbelmann, Basle and Middlesex; H. A. Clarke, Guy's; A. M. Clarkson, Univ. Coll.; L. I. Cohen, London; S. M. Cohen, Cape and Guy's; Elizabeth Cooper, Royal Free; R. A. S. Cory, Bristol; W. W. Craner, London; T. V. L. Crichlow, King's College; H. W. D. Crook, Guy's; S. H. Croot, Cambridge and Guy's; T. M. Davie, Oxford and Middlesex; Evelyn M. Davies and H. S. Davies, King's College; C. C. Davis, Univ. Coll.; D. C. L. Derry, St. Thomas's; P. C. C. De Silva, King's College; J. S. Dinsdale, Leeds; Marjorie M. Dobson, Royal Free; Archibald Dodd, Liverpool; F. T. Doleman, St. Mary's; R. M. Dowdeswell, Cambridge and St. Thomas's; Richard Doyle, Liverpool; E. C. Duffett, Cambridge and Guy's; J. T. Dunkerley, Cambridge and St. Bart.'s; F. W. Earle, Liverpool; E. L. Edmondson, Cambridge and London; Dorothy E. Eglington, Royal Free; H. F. Ellis, Liverpool; Mahmoud Mohamed El Toubi, Cairo and Sheffield; C. N. Evans, St. Bart.'s; Geraldine W. Everett, Royal Free; J. S. S. Fairley, Cambridge and Birmingham; W. B. Fiddian-Green, Cape, Oxford, and St. Mary's; R. L. Flett, Otago; H. T. Flint, Westminster; Agnes B. Francklyn, Royal Free and St. Mary's; G. H. V. Froggatt, Sheffield; Maximo Gambon, Costa Rica and St. Bart.'s; J. H. P. Games, Univ. Coll.; Ishak Kirolos Gayld, Cairo; W. N. O. George, Cardiff and Univ. Coll.; Reginald Glanvill, Guy's; F. W. H. Grenier, Cambridge and London; Valentina Pavlovna Guercken, Westminster; H. W. Guinness, St. Bart.'s; F. R. Gusterson, St. Thomas's; Linnie A. Hamar, Charing Cross; W. F. L. Hannay, Guy's; W. G. Harvey, St. Mary's; C. K. Haskard, Adelaide and London; W. E. Herbert, Guy's; H. P. Himsworth, Univ. Coll.; Benjamin Hoffenberg, Cape and Liverpool; J. H. Hopper, Cambridge and St. Thomas's; Stanford Howard, Oxford and London; C. F. Howes, St. Thomas's; Maurice Hurwitz, Leeds; Esmé I. Hyam, Univ. Coll.; John Ives, St. Mary's; L. A. Joelson, Cape and London; C. H. Johnson, Guy's; D. T. Jones, Cardiff and Guy's; G. R. Jones, Cambridge and King's College; J. G. Jones, Cambridge and Univ. Coll.; Hassenjee Joomye, Middlesex; P. G. S. Kennedy, Cambridge and London; Esther M. Killick, Leeds; Simon Kin, King's College; R. W. Knowlton, Cambridge and Middlesex; T. C. Kohler, Adelaide and London; Marie Krestin, Charing Cross; Lekhraj Rochiram Lalwani, Bombay and London; A. L. Light, Leeds; T. K. S. Lyle, Cambridge and King's College; R. G. Macbeth, Oxford and King's College; A. L. McFarlane, King's College; C. M. MacGeoch, Birmingham; W. Mc.O. MacGregor, Cambridge and London; Kundan Lall Malhautra, Punjab and Univ. Coll.; C. E. Martin, Birmingham; E. R. R. Mellon, Guy's; W. T. Mills, St. Bart.'s; Joseph Mindline, Westminster; A. D. Morton, Cambridge and St. Thomas's; L. H. Mottet, Univ. Coll.; E. C. Murphy and J. R. Murray, London; Edith G. Niven and Eric Ogden, Univ. Coll.; C. R. L'E. Orme, Cambridge and King's College; C. G. Paine, St. Mary's; V. E. Palmer, Cambridge and St. Thomas's; Keren I. Parkes, King's College; G. F. D. Perrott, Birmingham and St. Bart.'s; E. R. S. Phillips, Oxford and London; G. W. Pickering, Cambridge and St. Thomas's; P. H. L. Playfair, Cambridge and King's College; T. R. Plummer, Oxford and St. George's; E. E. Prebble, Liverpool; Norman Pyecroft, Leeds; Henry Richards, Guy's; H. G. G. Robertson, St. Thomas's; R. D. Robinson, St. Bart.'s; R. S. Robinson, Middlesex; Margaret C. Rosser and H. W. Round, Birmingham; E. L. Rubin, Liverpool; D. J. Sagor, Cape and London; G. H. Sanderson, Cambridge and Univ. Coll.; Raghunandan Vinayak Sanzgiri, Bombay and London; J. E. Schneider, St. Thomas's; S. A. Scorer, Guy's; Elizabeth H. Scurfield, Royal Free; Mary C. Seward, Cambridge and Univ. Coll.; R. R. Shapland, Middlesex; Samuel Shone, Guy's; Maurice Silverstone, Liverpool; J. E. Snow, St. Bart.'s; Ernest Somasekhar, Madras and Birmingham; Vencatachari Srinivasan, Madras and Middlesex; Barry Stewart, Cambridge and Leeds; J. O. Terry, Leeds; P. R. Thambugala, Calcutta and Middlesex; A. R. Thomas, Cambridge and St. George's; C. P. K. Toland, Cambridge and Westminster; E. A. Utting, St. Mary's; H. D. Vasey, St. Thomas's; R. G. L. Waller, Westminster; David Wardrop, Birmingham and St. Mary's; Jack Wasserzweig, Cape and London; Olive C. Watkin, Charing Cross; C. E. W. Wheaton, St. Thomas's; A. T. D. Whitfield, Birmingham; L. V. Williams, Cardiff and St. Bart.'s; L. K. Wills, Cambridge and Guy's; Alan Wilson, Leeds; John Winter, Middlesex; F. W. J. Wood, Cambridge and St. Bart.'s; Margaret D. Wright, Univ. Coll.; J. M. Wrigley, Sheffield and London; Nubar Yacoubian, Birmingham; and H. S. T. Young, Cambridge and St. Thomas's.

The Streatfeild Research Scholarship was awarded to Dr. R. A. Hickling, and the Jenks Memorial Scholarship to Hugh Donald Fleming, late of Epsom College.—The appointment of Dr. J. A. Glover to the Milroy Lectureship for 1930 was announced, and Mr. W. A. Greene, K.C., was elected Senior Standing Counsel to the College.—The following were elected as Councillors: Dr. C. R. Box, Dr. J. H. Thursfield, Dr. Charles Bolton, Sir Charlton Briscoe, and Dr. J. A. Arkwright.—Sir Francis Champneys was re-elected to represent the College on the Central Midwives Board.—Dr. Raymond Crawfurd was re-elected a member of the committee of management.

SOCIETY OF APOTHECARIES OF LONDON.—At recent examinations the following candidates passed in the undermentioned subjects:—

Surgery.—G. N. Beeston, Charing Cross Hosp.; J. M. Connor, St. Mary's Hosp.; L. P. Gregory, Bristol; H. H. Jackson, Charing Cross Hosp.; E. P. Johnson, Manchester; A. A. Leibovitch, Kharkoff and London Hosp.; K. R. Lundeberg, Minnesota, U.S.A.; and D. F. Michael, St. Mary's Hosp.

Medicine.—A. R. D'Abreu, Leeds; E. A. Johnstone, Manchester and Charing Cross Hosp.; T. K. S. Lyle, King's College Hosp.; C. P. Madden, St. Bart.'s Hosp.; A. F. Quarmby, Birmingham; and A. E. Vawser, London Hosp.

Forensic Medicine.—G. E. Bent, Manchester; J. M. Connor, St. Mary's Hosp.; A. R. D'Abreu, Leeds; A. E. Gibbs, London Hosp.; E. A. Johnstone, Manchester and Charing Cross Hosp.; T. K. S. Lyle, King's College Hosp.; M. H. Rashwan, Guy's Hosp.; and R. W. Scanlon, St. Thomas's Hosp.

Midwifery.—J. M. Connor, St. Mary's Hosp.; N. Das, London Hosp.; W. S. Ghai, Charing Cross Hosp.; M. Hurwitz, Leeds; E. A. Lipkin, Liverpool and Charing Cross Hosp.; E. O'C. Parsons, Sheffield and St. Bart.'s Hosp.; A. F. Quarmby, Birmingham; R. W. Scanlon, St. Thomas's Hosp.; and A. W. B. Wiggins, Sheffield.

The Diploma of the Society was granted to the following candidates, entitling them to practise medicine, surgery, and midwifery: A. R. D'Abreu, A. E. Gibbs, M. Hurwitz, H. H. Jackson, A. A. Leibovitch, C. P. Madden, A. F. Quarmby, and A. E. Vawser.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—At the Dental Examinations just concluded the following were the successful candidates:—

FIRST DENTAL PROFESSIONAL EXAMINATION.

Charles Purves Moore.

Biology.—Christine Evelyn Rose and Eric Thomas Jardine Dykes.

FINAL PROFESSIONAL EXAMINATION.

L.D.S. R.C.S. Edin.—Dorothy Williams, John Watson Gregory, Terence George Ward, Hamish Gordon Somerville, William James Rankine, Agnes Ferguson Miller, Peter Jackson Veitch Robertson, Duncan Gould, Owen Hartley Wicksteed, Francis Kerr Fenton, Eric Howarth Watson, William Russell Logan, Robert Allan Wilson McKendrick, and Fathi Soliman Abaza.

Pathology.—Donald McLeod Stuart.

Medicine.—George Gordon Brown and William Paterson Shand.

Surgery.—George Gordon Brown and William Paterson Shand.

Dental Subjects.—Joseph Gordon Medcalf and Mark Lessnoff.

UNIVERSITY OF MANCHESTER.—Dr. E. W. Twining has been appointed lecturer in radiology.

UNIVERSITY OF LEEDS.—The annual dinner of past and present students of the School of Medicine, Leeds, will take place on Nov. 9th at the Hotel Metropole, Leeds, under the presidency of Dr. C. W. Vining.

ROYAL INSTITUTE OF PUBLIC HEALTH.—The next annual congress of this Institute will be held in Zurich during Whitsuntide, 1929, the dates being May 15th–20th.

BRITISH INSTITUTE OF RADIOLOGY AND RONTGEN SOCIETY.—The annual dinner of the British Institute of Radiology incorporated with the Rontgen Society, will be held at the Trocadero Restaurant, Piccadilly-circus, London, on Friday, Nov. 16th, at 7.30 for 7.45 P.M. The President, Mr. G. W. C. Kaye, D.Sc., will take the chair.

BRITISH COMMITTEE ON RHEUMATISM.—A meeting to consider the reorganisation of this committee on a wider and more independent basis will be held at the house of the Royal Society of Medicine, 1, Wimpole-street, London, W., on Wednesday, Nov. 7th, at 5 P.M. Any member of the medical profession interested in this proposal is invited to attend.

GLASGOW UNIVERSITY CLUB, LONDON.—The annual autumn dinner of this club is to be held at the Trocadero Restaurant, Piccadilly-circus, on Friday, Nov. 23rd, at 7.15 for 7.30 P.M., when Mr. James Bonar, LL.D., will preside. Any Glasgow University men who, though not members of the club, would like to attend are requested to communicate with the Hon. Secretaries at 62, Harley House, N.W. 1.

POST-GRADUATE COURSE ON DISEASES OF THE CHEST.—The Joint Tuberculosis Council has arranged a course of post-graduate lectures and demonstrations on the Pathology of Tuberculosis and Allied Chest Diseases, to be given at the City of London Hospital, Victoria Park, E., from Nov. 26th to Dec. 1st. The lecturers will be Dr. S. Roodhouse Gloyne, Dr. W. Burton Wood, Dr. F. G. Chandler, Dr. Clive Riviere, Mr. R. H. O. B. Robinson, Dr. H. V. Morlock, and Dr. J. V. Sparks, and the wards and special departments of the hospital will be open to members of the course. Further information may be had from Dr. William Brand, hon. secretary of the Council, at The Larches, Farnham Royal, Bucks.

DONATIONS AND BEQUESTS.—By the will of the late Dr. J. J. Perkins, St. Thomas's Hospital Medical School will receive £1000 for research work.—The late Alderman James G. Lowe, J.P., of Stalybridge, Cheshire, left by will £1000 to the District Infirmary, Ashton-under-Lyne, for the Endowment Fund.—The Orthopædic Hospital and Home for Crippled Children, Bristol, will benefit by the sum of £500; and the Royal Infirmary, Bristol, the General Hospital, Bristol, and the Bristol Eye Hospital by £250 each, under the will of the late Mr. F. C. Niblett, of Clifton, Bristol.—The late Miss Alice Temple, of Kingston-on-Hull left among other bequests £500 to the Hull Royal Infirmary and £250 each to the Hull Blind Institution, the Hull and Sulcoates Dispensary, and the Victoria Children's Hospital, Hull.—The Middlesex Hospital has received from Mr. G. Vaughan Morgan a further donation of £5000 for the rebuilding fund.—St. Mary's Hospitals, Manchester, have received the following legacies: Executors of the late Sir Edward Holt, £1000; executors of the late Henry Franc, £500.—The King has forwarded £728 to the Queen's Institute of District Nursing, the proceeds of the opening of the Sandringham Gardens to the public during the season, —Mr. Charles Curd, M.R.C.S., of Bath, left £250 each to the Royal United Hospital, Bath, and the Monmouth-street Society, Bath.

NEW TREASURER OF RADCLIFFE INFIRMARY.—Mr. W. W. Goodenough, of Broadwell Manor, Lechlade, has been elected honorary treasurer of the Radcliffe Infirmary, Oxford, in succession to the Rev. G. B. Cronshaw.

ST. THOMAS'S HOSPITAL DINNER.—Mr. E. F. White took the chair at the annual dinner at St. Thomas's House on Oct. 26th. He had found records, he said, of an anniversary dinner held as long ago as 1822, and he felt sure that the custom had been going on for more than 100 years. He himself had entered the hospital in 1876 when there were many remnants of the old Surrey-gardens tradition, of which he gave some entertaining reminiscences. As an old captain of cricket and football he hoped to see St. Thomas's House filled with cups, and he would like to know where were the records of the past 50 years. When the present generation could do better than his own generation he would take off his hat to them. Mr. G. Q. Roberts referred to the scheme for transferring the medical school to the other side of the road and building an extension of the hospital where the school now stands. He also spoke of the appointment of Dr. R. J. C. Thompson to succeed Dr. L. B. Maxwell as medical secretary. Prof. L. S. Dudgeon, as Dean, said that he doubted whether the medical school had ever been in a more flourishing condition. This was especially due to the skill, enthusiasm, and devotion of Sir Cuthbert Wallace over a period of ten years, and he thought that no man had ever done more for the welfare of the hospital. After referring to the losses sustained during the past year, with special mention, among others, of Sir Bryan Donkin, Dr. Chisholm Williams, and Dr. J. J. Perkins, Prof. Dudgeon went on to speak of the knighthood conferred on Mr. Percy Sargent and of recent changes in the staff. Dr. S. J. Cowell had been elected to the new chair in dietetics; Dr. W. H. B. Stoddart was retiring to a leisure in which he would be able to think still higher thoughts; and the place of Dr. Thomas Carnwath as lecturer in public health had been taken by Dr. C. T. Maitland. A post-graduate course had been held in September and had proved a colossal success. Next year it might be held at the time of the annual dinner. After recounting the athletic honours of the year—including the winning of the golf, tennis, second XI. hockey, and the boxing for the third year in succession—and the academic distinctions, Prof. Dudgeon concluded by proposing the health of the chairman. Besides being anæsthetist to the hospital, Mr. White, he said, had been a great athlete, an international Rugby footballer—which very few anæsthetists to the hospital now were—and had taken an important part in founding the new St. Thomas's House.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY, Albemarle-street, W.

THURSDAY, Nov. 8th.—4.30 P.M. *The following papers will be read:* S. B. Schryver, F.R.S., and E. J. Candlin: Investigations on the Cell Wall Substances of Plants, &c. S. Dickinson: Experiments on the Physiology and Genetics of the Smut Fungi. (Communicated by V. H. Blackman, F.R.S.) Isabella Gordon: Some Further Studies in the Development of the Skeleton in Echinoderms. (Communicated by E. W. MacBride, F.R.S.) R. R. Gates and F. M. L. Sheffield: Chromo some Linkage in certain Œnothera Hybrids. (Communicated by Sir John Farmer, F.R.S.) *The following papers will be read in title only:* Ruth Deanesly: A Study of the Adrenal Cortex in the Mouse and its Relation to the Gonads. (Communicated by J. P. Hill, F.R.S.) W. J. Dakin: Anatomy and Phylogeny of Spondylus, with a particular reference to the Lamellibranch Nervous System. (Communicated by E. W. MacBride, F.R.S.) W. J. Dakin: The Eyes of Pecten, Spondylus, Amussium and Allied Lamellibranchs with a short discussion on their Evolution. (Communicated by E. W. MacBride, F.R.S.) C. E. Walker: Artefacts as a Guide to the Chemistry of the Cell. [illegible] by Sir John Farmer, F.R.S.) F. F. [illegible] and P. Parija: Analytic Studi[illegible] (1). P. Parija: Analytic Studi[illegible] (2). The Respiration of Apples in Nitrogen and its [illegible] Air. (Communicated by [illegible]) F. F. Blackman, F.R.S.: [illegible] Respiration (3). Formulatic[illegible] the Respiration of Apples a[illegible]

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, Nov. 5th.—8.30 P.M., DISEASE IN CHILDREN. A Discussion will be held on Fibrosis of Lung. Openers: Dr. L. S. T. Burrell, Mr. Tudor Edwards.

TUESDAY.—5.30 P.M., ORTHOPÆDICS. (Cases at 4.30). 8.30 P.M., PATHOLOGY. Laboratory Meeting at University College Hospital Medical School.

WEDNESDAY.—5 P.M., HISTORY OF MEDICINE. The following papers will be read:—Dr. Philip Gosse: Pirate Surgeons. Mr. Percy Flemming: The Medical Aspect of the Mediæval Monastery. Dr. Charles Singer: The Medical Manuscripts of Sir William Petty. 8.30 P.M., SURGERY. Presidential Address: Sir Holburt Waring: Surgical Education and Surgical Practice in the Future.

THURSDAY.—5 P.M., BALNEOLOGY. Presidential Address by Dr. G. L. Kerr Pringle. 8 P.M., NEUROLOGY. Clinical Meeting, West End Hospital for Diseases of the Nervous System, Out-patient Department, Welbeck-street, W.

FRIDAY.—5.30 P.M., CLINICAL. (Cases at 5 P.M.) Cases will be shown by Dr. C. F. T. East: (1) Case of pulsating liver. Dr. J. G. Y. Bell: (2) Case of sacro-coccygeal tumour. Mr. H. C. Edwards: (3) Case of syphilitic disease of the radius. Mr. C. P. G. Wakeley: (4) Case of recurrent dislocation of the hip, and (5) Case of clicking hip. Dr. C. Worster-Drought: (6) Case of acromegaly. Other cases will be shown. 8 P.M., OPHTHALMOLOGY. Cases will be shown. Papers: Mr. A. H. Levy: Injury of Lens Causing Alteration of Refraction. Mr. A. F. MacCallan: Ocular Manifestations of Local Sepsis.

HUNTERIAN SOCIETY.

MONDAY, Nov. 5th.—9 P.M. (in The Cutlers' Hall, Warwick-lane, E.C.). Discussion on The Doctor on the Stage. Dame Madge Kendall, Sir StClair Thomson, Lady Simson (Miss Lena Ashwell), Dr. Harold Dearden, and Mr. Ivor Back have promised to take part in the discussion.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.

TUESDAY, Nov. 6th.—5 P.M., Dr. G. F. Still: History of Pædiatrics to the end of the Sixteenth Century. (First FitzPatrick Lecture.)

THURSDAY.—5 P.M. (Concluding FitzPatrick Lecture.)

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.

MONDAY, Nov. 5th.—5 P.M., Mr. T. W. P. Lawrence: Demonstrations of Surgical Specimens.

THURSDAY.—5 P.M., Mr. C. H. Fagge: Axial Rotation, Purposeful and Pathological. (Bradshaw Lecture.)

UNIVERSITY COLLEGE, Gower-street, W.C.

MONDAY, Nov. 5th.—5 P.M., Prof. E. B. Verney: Urinary Secretion. (Fourth lecture.)

FRIDAY.—5 P.M., Prof. J. C. Drummond: Recent Work on Vitamins. (Fifth lecture.) 5.30 P.M., Dr. J. Owens, A.M.I.C.E.: Smoke Pollution of the Air and Public Health. (Second public lecture.)

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, Nov. 5th.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Simmonds: Surgical Out-patients.

TUESDAY.—11 A.M., Mr. Endean: Venereal Diseases (demonstration). 2 P.M., Dr. Shaw: Medical Out-patients. 2 P.M., Mr. Hamblen Thomas: Throat, Nose and Ear Department.

WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. 2 P.M., Mr. Tyrrell Gray: Operations. 2.30 P.M., Mr. Donald Armour: Surgical Wards. 4.30 P.M., Dr. Trevor Davies: Gynæcological Diagnosis.

THURSDAY, Nov. 1st.—10 A.M., Dr. Grainger Stewart: Neurological Department. 2 P.M., Dr. Ironside: Medical Out-patients. 2 P.M., Mr. Bishop Harman: Eye Department.

FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department.

SATURDAY.—9 A.M., Mr. Vlasto: Operation on Throat, Nose and Ear. 9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Diseases of Children.

Daily, 10 A.M. to 5 P.M., Saturdays 10 A.M. to 12 noon. Medical and Surgical In-patients and Out-patients. Operations, Special Departments, Anæsthetic Course.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Nov. 5th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin and Eye Clinics. Operations.

THURSDAY, Nov. 1st.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Nov. 5th, to SATURDAY, Nov. 10th.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Lecture by Mr. Aleck Bourne: When is the Retroverted Uterus a cause of Symptoms? on Mon. at 5 P.M. CHARING CROSS HOSPITAL, W.C. Clinical Demonstration in Gynæcology by Dr. Everard Williams at 2 P.M on Wed. PRINCE OF WALES'S HOSPITAL, Tottenham, N. Clinical Demonstration in General Surgery by Mr. E. Gillespie at 3 P.M. on Fri. WELLCOME MUSEUM OF MEDICAL SCIENCE, 33, Gordon-street, W.C. Wed. at 4 P.M., Demonstration by Dr. G. Carmichael Low on Recent work on Blood Diseases. The above are free. HAMPSTEAD GENERAL HOSPITAL, Haverstock Hill, N.W. Practitioners' Course. Second week, lectures and demonstrations in medicine, surgery and special departments. 4.30 to 6 P.M. daily. LONDON LOCK HOSPITAL, Dean street, W. Course of Clinical Demonstrations in Venereal Disease, every afternoon for four weeks.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY, Nov. 8th.—4 P.M., Mr. Twistington Higgins: Acute Appendicitis.

CENTRAL LONDON THROAT NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.

FRIDAY, Nov. 9th.—4 P.M., Mr. J. D. McLaggan: Otosclerosis.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, Nov. 6th.—5 P.M., Dr. H. W. Barber: Immunity and Anaphylaxis.

THURSDAY.—5 P.M., Dr. W. J. O'Donovan: Occupational Dermatitis.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

TUESDAY, Nov. 6th.—3.15 P.M. (at the Royal Chest Hospital) Dr. A. W. Stott: Demonstration of Cases in the Wards.

ST. PAUL'S HOSPITAL POST-GRADUATE COURSE, Endell-street, W.C.

THURSDAY, Nov. 8th.—4.30 P.M., Mr. W. K. Irwin: The Diagnosis and Treatment of Some Important Bladder Conditions.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.

WEDNESDAY, Nov. 7th.—4 P.M., Dr. T. F. Cotton: Diseases of the Heart and Blood-vessels in Relation to Industrial Occupations.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, Nov. 6th.—4.15 P.M., Mr. C. Roberts: Early Symptoms of Cholecystitis.

FRIDAY, Nov. 9th.—4.15 P.M., Prof. R. B. Wild: The Treatment of Patients with Inoperable Cancer.

ANCOATS HOSPITAL POST-GRADUATE LECTURES, Mill-street, Manchester.

THURSDAY, Nov. 8th.—3.45 P.M., Dr. Renshaw: Recent Advances in Medical and Surgical Antiseptics.

Appointments.

BURNET, M., M.D., C.M. Edin., has been appointed a Medical Referee under the Workmen's Compensation Act for the Central District, Sheriffdom of Perth.

CLAY, JOHN, M.B. Durh., F.R.C.S. Eng., Lecturer in Surgery in the University of Durham.

GAUNT, MARIA L., M.B., Ch.B. Leeds, Assistant Medical Officer, Leeds Maternity and Child Welfare Centre.

JONES, E. CATHERINE MORRIS, M.B., B.S. Durh., B.Hy., D.P.H., Maternity and Child Welfare Medical Officer, Gloucestershire County Council.

MARSHALL, J. L., M.B., Ch.B. Dub., Medical Officer of Markethill Dispensary District, Armagh.

MORTON, JANET M., M.B., Ch.B. Edin., D.P.H., Assistant Medical Officer, Greenwich.

PRICHARD, A. A., M.D., B.Ch. Camb., Honorary Assistant Surgeon to the Ear, Nose and Throat Department, Cardiff Royal Infirmary.

TWINING, E. W., L.R.C.P. Lond., M.R.C.S., D.M.R.E. Camb., Lecturer in Radiology in the University of Manchester.

Certifying Surgeons under the Factory and Workshop Acts: ATKINSON, J. A., M.B., B.S. Lond. (Newnham, Gloucester); THOMAS, R., M.B., B.S. Lond. (Hirwain, Glamorgan); and WEATHERHEAD, A. G. N., M.B., Ch.B. Edin. (Stretford, Lancashire).

Vacancies.

For further information refer to the advertisement columns.

Aylesford, Kent, British Legion Village, Preston Hall.—Res. H.P. £100.

Birmingham City.—M.O. for Maternity and Child Welfare. £600.

Birmingham, City Babies Hospital.—Res. M.O. At rate of £150.
Birmingham City Hospital, Little Bromwich.—Third Asst. M.O. £350.
Birmingham, Midland Ear and Throat Hospital.—Asst. Surg. O. Also Second H.S. £200 and £150 respectively.
Cardiff, Prince of Wales' Hospital.—H.S. £120.
Delhi, Indian Red Cross Society.—Organising Secretary. Rs.1200 to Rs.1500 per mensem.
Dreadnought Hospital, Greenwich.—Med. Supt. £300.
Dumfries, Crighton Royal Mental Hospital.—Clinical Pathologist. £400.
East Lo [illegible] *&c., Shadwell, E.*—Asst. Surg. £600.
Exeter [illegible] t. M.O. £300.
Exeter, [illegible]
Frimley [illegible] *Sanatorium.*—Sen. and Jun. H.P.'s. At rate of £150 and £100 respectively.
Golden square Throat, Nose and Ear Hospital, W.—H.S. £100.
[illegible] *ugh.*—M.O.H. £1000.
County Sanatorium.—Third Asst. Res. M.O. £400.
Islington Dispensary, 303, Upper-street, N.—Asst. Res. M.O. £220.
King's College Hospital, Denmark Hill, S.E.—Sister-Matron.
Lahore, King Edward Medical College.—Professor of Pathology; Rs.1200–50—2100 per mensem.
Leamington Spa, Warneford General.—H.P. and H.S. Each £165.
L.C.C. Mental Hospitals Service.—Eighth Asst. M.O. £300.
London Jewish Hospital, Stepney Green, E.—Hon. Asst. Phys.
Manchester Royal Infirmary.—Res. Clin. Pathologist. £100.
Norwich, Norfolk and Norwich Hospital.—H.S. to Ear, Nose, and Throat Department. £120. Also H.S. £120.
Nottingham, General Hospital.—H.S. At rate of £150.
Nottinghamshire County Council.—Tuberculosis Officer. £750.
Portsmouth, Royal Portsmouth Hospital.—Sen. H.S. At rate of £200.
Princess Louise Kensington Hospital for Children, N. Kensington. Hon. Asst. S. to Nose, Throat and Ear Dept.
Queen's Hospital for Children, Hackney-road, E.—H.P., H.S., and Cas. O. Each at rate of £100.
Reading, Royal Berkshi [illegible] *gist, &c.* £750. Also Third H.S. and [illegible] rate of £150.
St. Mary's Hospital for W [illegible] —Hon. Asst. P.
St. Peter's (Whitechapel) [illegible] *e-road, E.*—Res. Asst. M.O. At rate of £450.
West Bromwich, Hallam Hospital.—Res. H.S. £250.
West London Hospital, Hammersmith-road, W.—H.P., H.S. Also Aural and Ophth H.S. Each at rate of £100.
Windsor, King Edward VII. Hospital.—Sen. H.S. Also Jun. H.S. At rate of £120 and £100 respectively.
Worcester General Infirmary.—Jun. Res. M.O. £120.
Worcestershire County Council.—Asst. County M.O. £600.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Prescot (Lancashire), and Huntly (Aberdeenshire).

Births, Marriages, and Deaths.

BIRTHS.

COLE.—On Oct. 26th, at 3, Wilbraham-place, S.W., the wife of Leslie Cole, M.D., M.R.C.P., of Trumpington-street, Cambridge, of a son.

HART.—On Oct. 22nd, at Platt's-lane, N.W., the wife of S. L. Hart., L.D.S., of a daughter.

HORNIBROOK.—On Oct. 25th, at Ethorpe House, Gerrard's Cross, the wife of H. Nevill Hornibrook, M.B., B.S. Lond., of a son.

MATHER.—On Oct. 23rd, at Lindfield, Hayward's Heath, the wife of Dr. F. H. Mather, of a son.

DEATHS.

ABRAM.—On Oct. 24th, at Reading, Sir George Stewart Abram, J.P., M.B. Camb., in his 63rd year.

HARTLEY.—On Oct. 21st, at Royal-avenue, Scarborough, Reginald Hartley, M.D., F.R.C.S., in his 76th year.

KNIGHT.—On Oct. 25th, at Mecklenburgh-square, W.C., Edward Knight, M.R.C.S., late of Cook's School, in his 69th year.

TOMES.—On Oct. 24th, at Mannington Hall, Aylsham, Sir Charles Sissmore Tomes, M.A., LL.D., F.R.S., F.R.C.S., in his 83rd year.

WARREN.—On Oct. 23rd, at Frith Cottage, East Farleigh, Kent, John Grant Warren, L.R.C.P. & S., D.P.H.

WETHERED.—On Oct. 28th, at his residence, Falmouth, Frank Joseph Wethered, M.D., F.R.C.P., in his 69th year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE LANCET: SUBSCRIPTION RATES.

INLAND	One Year	£2	2	0
	Six Months	1	1	0
	Three Months	0	10	6
ABROAD	One Year	2	10	0
	Six Months	1	5	0
	Three Months	0	12	6

Notes, Comments, and Abstracts.

ALCOHOL AND DRUG ADDICTION IN RELATION TO MENTAL DISORDER.*

BY HUBERT J. NORMAN, M.B. EDIN.,

MEDICAL SUPERINTENDENT OF CAMBERWELL HOUSE; LECTURER IN MENTAL DISEASES AT WESTMINSTER HOSPITAL.

IT is difficult to discuss this subject without becoming controversial, for it is not yet so scientifically delimited as to be free from theory and hypothesis. According to some authorities, alcohol and drugs are actually responsible for quite a large proportion of cases of mental disorder, while to others these factors are incidental and enciting rather than causative. It will be admitted that alcohol and habit-forming drugs do have a very definite influence on nervous tissue, but whether this influence is invariably deleterious is disputed. At present, however, we are dealing with those cases in which deterioration has taken place. The dire effects upon the nervous system are but one aspect of the matter. Other parts of the economy are involved, so that the deterioration may be general. Speaking at the recent Anti-Alcoholic Congress at Antwerp, Sir Arthur Newsholme said that in his view the direct and indirect deaths caused by alcoholism are under-stated at 5 per cent. (11,000) among adult males in England. Tuberculosis, syphilis, and alcoholism are probably responsible for a majority of the total male deaths occurring between adolescence and old age, and alcohol is not the least deadly of the three enemies.

Fundamental Symptoms.

Broadly considered, the effects on the cerebral cortex are, as Dercum has pointed out, the same. "Each form of intoxication is distinguished by its own special features, though in its fundamental characters it resembles every other." The variations in symptomatology appear to depend more upon the quantity of the drug and the period of time over which it is taken than upon essential differences in their effects. The chief reason for taking these substances is in order to produce euphoria. The desire may be to chase away gloom and despondency or to heighten the feeling of well-being and of competence to undertake tasks for which the individual might otherwise consider himself incapable. Indeed, it is the feeling of inadequacy which so often lies behind the excesses; or, in more fashionable language, it is an "inferiority complex" which is responsible. Usually, therefore, it is the neuropathic or unstable individual who becomes an addict or, at least, who develops morbid mental symptoms.

An interesting point is the differences of susceptibility to the effects of alcohol and drugs, even in the same individual at different times or in different circumstances. Especially important is the lowered resistance brought about by head injuries.

There seems to be little doubt that the cortex is responsible for the system of inhibitions or checks upon which the social organisation depends. Interference with these may not be accompanied by any special danger if it does not go too far. Indeed, it may be of some utility where, for example, it allows the shy and diffident person to overcome his temperamental difficulties when necessity arises. The danger lies in too frequent recourse to this assistance. Since the feeling of inadequacy is often dependent upon constitutional defect, inherent or acquired, it is easy to understand how habit-formation may occur. The weakening of inhibition may, however, go to further stages and be demonstrated by changes of conduct such as extreme boastfulness, excessive irritability, and quarrelsomeness, and even outbreaks of maniacal fury. It is only necessary to recall such conditions as amok, Berserk rage, mania à potu, and the deeds of the tribe of assassins who took hashish. Doubtless these outbursts are allied to the epileptiform attacks—or to the actual epilepsy—which occur in association with some cases of chronic alcoholism. Impulsive suicidal acts also occur. Such overactions depend upon lower ranges of cells, which are allowed to function more or less unchecked. These, being more primitive and more stable, resist the toxic influences longer, but in due course more and more of them are interfered with or put out of action and other mental changes then ensue.

Intellectual Impairment.

With these changes there may be intellectual impairment of varying degree. Although there may be lucidity there may be, on the other hand, mental confusion even to the

* A lecture delivered before the Society for the Study of Inebriety on Oct. 9th.

stage of delirium, with disorientation and disordered movements. This is a familiar result of taking alcohol; but it may be produced by other drugs, for example, chloral and chlorodyne, cocaine and heroin. These results should be borne in mind when hypnotics and sedatives are being administered in order to procure sleep. If they are not given in sufficient quantities to inhibit the action of cells other than those of the cortex, there may be increased confusion and restlessness, as during the induction stage of anæsthesia.

Association of ideas, at first stimulated, is eventually slowed down as deterioration takes place. It may be suggested that the primary stimulation is shown more in the shape of excessive imagination, even of fantastic conceptions, than as actual intellectual output. As we have become accustomed to attach an undue value to works of imagination we are apt to lose sight of their lack of real intellectual content. In this connexion may be noted frequent illogicality—or at least wayward associations—exemplifying Mr. Dooley's dictum that though alcohol may be a good thing to talk on, it is a bad thing to think on! The intellectual deterioration shows itself in other ways. There is impairment of the moral sense, so that the victims develop into liars and will do or say anything to gain their ends. There is increased egotism. The patients are untidy and careless about personal cleanliness; they are unpunctual and unreliable. They may be acquisitive even to the point of thieving. It is well to remember the importance of this from the legal point of view. The possibility of sexual derelictions is also to be noted; latent impulses emerge unchecked.

Illusions, Hallucinations, and Memory Defects.

Illusions of sight and of the other senses may occur. Numbers of stories about drink and its effects have for their basis this tendency to misinterpret sensations. These illusions depend also upon impairment of association; wrong associations are formed often with ludicrous or grotesque effects. Hallucinations are most often of sight or of hearing, and may be transient or chronic, resembling paraphrenia. Delusions are formulated in some cases. As there is apt to be suspiciousness these may take a persecutory form or, not uncommonly, false beliefs of marital infidelity. As they are accompanied by weakening of self-control, they may lead to homicidal acts. The memory is also impaired. There is defect of fixation of new memories, and also retrograde amnesia. The combination of these leads to a paucity of ideas and consequently to a general mental restriction. Hence the wearisome iteration which is characteristic of the chronic alcoholic. As there may be, in addition, paramnesia, or "false" memory, where the hiatus in recollection is filled in with imaginary details, it is easy to understand how fabrication or romancing may occur. It is often difficult to decide how much this lying is due to paramnesia or how far it is wilful perversion of the truth.

There may be aboulia, or loss of will-power, so that the individual fails to carry through schemes which he may still have the power to formulate. He finds dreaming and scheming more easy than effort. As there may also be indifference and apathy the lack of executive ability does not worry him. On the other hand, he may be conscious of his defect yet unable to overcome it. Generally, however, in cases of long standing, there is real loss of insight and of appreciation of the defects of conduct which are no noticeable to the onlooker.

Special Symptom-complexes.

Special symptom-complexes are, of course, found in association with particular substances. As alcohol is the most readily obtained, cases of mental disorder associated with it are the most familiar. The most dramatic of these is, probably, delirium tremens. The polyneuritic psychosis (Korssakow's disease) is of great interest in demonstrating that other parts of the nervous system are implicated.[1] Dipsomania is a link with the psychoses which are not dependent ætiologically upon drugs, for it appears to be related to, or to be a variety of, manic-depressive insanity. Epileptiform attacks in association with alcohol demonstrate, may be, the alliance with idiopathic or true epilepsy. The occurrence of alcoholic paranoia and hallucinosis inevitably suggest a relationship with ordinary paranoia and with paraphrenia.[2] In some instances mental disorder is the primary trouble and the taking of alcohol is only incidental, and in this connexion may be noted manic-depressive insanity, general paralysis of the insane, epilepsy, and dementia præcox. Here we have a vicious circle, and without a doubt the alcohol tends to accelerate mental impairment. Where alcohol and other substances are taken the outbreak is still more grave.

It appears, therefore, that the taking of alcohol and other drugs, if persistent and excessive and linked, as it often is, with neuropathic defect, tends to bring the individual steadily towards the common ending of all chronic mental disorders—namely, mental impairment or even profound dementia. The minor degrees of this mental reduction may be overlooked for various reasons. For example, the chief deterioration may be in the "moral sense" and intelligence may appear unimpaired. Much greater latitude is usually allowed the individual in wickedness and depravity than in other directions. He may become a liar, or swindler, or a knave with less social reproval, maybe, than if he lets his clothes fall into disarray or forgets his table manners.

The nervous system has great potentiality for recovery even when it has been subjected for long periods to the influence of drugs. It is difficult to prophesy, even when the symptoms are very pronounced, what the results will be if the patient can be guarded against further excesses. This is, however, a very difficult matter. We are free agents in the matter of doping ourselves into a state of obfuscation, however much we may be hedged and guarded in other directions. For this reason the more stringent safeguards in the matter of dangerous drugs are very valuable. If the patient does submit to treatment in time or will refrain from further doping, recuperation may be rapid and extensive. On the other hand, cell-disintegration may have taken place, and will remain to that extent mentally crippled.

The Legal Aspect.

The matter is fairly simple when the symptoms are obvious; when there are, for example, definite aberrations of conduct, hallucinations, and delusions. But when the degree of disorder is not so marked it may be impossible to draw an arbitrary line between the "certifiables" and the "uncertifiables." It helps very little to invoke the doctrine of free-will and to say that the individuals should refrain from excess and that their disorder is their own fault. We know that a number of them are the victims of circumstances—of the "tyranny of their organisation"—and thus fated, literally and metaphorically, to fall by the wayside. It seems as if for them the only solution of the problem is prohibition. Yet a good many would come to grief anyhow, and we cannot remove all forms of temptation. However much we are dragooned and made to conform to regulations it is still true that "to step aside is human." Let us continue, therefore, to heed the admonition of one who had his own sad experience and "gently scan our brother man," rather than deal harshly or unsympathetically with him.

[1] It occurs also in association with other substances, but most commonly with alcohol.

[2] It will be noted that alcohol and drugs can produce the symptoms associated with various forms of insanity. If these symptoms persist the person may be certifiably insane.

HEALTH IN UGANDA.

In the report on Uganda for 1927, recently issued on the authority of the Colonial Office, it is stated that the activities of the Medical Department were further extended during the year. There were 480,516 new cases recorded as having attended the various Government hospitals, dispensaries, treatment centres, &c. This is an increase of 100,117 cases over the number recorded for 1926, and nearly six times the number treated in 1920. The total attendances at the various medical units numbered 2,038,448, as compared with 1,795,358 in 1926. The total number of cases admitted to wards was 21,562 and the aggregate number of in-patient days' treatment was 420,743. This gives an average daily number in wards of 1153 as against 970 in 1926. There were 3383 surgical operations performed in the year; 2127 were recorded for the previous year. Deaths in hospital showed a decrease of 286, the figures for 1927 being 1111 and for 1926 1397. This was largely accounted for by the falling off in the number of cases of dysentery during the year and the absence of a virulent epidemic form of this disease.

There are four Government European hospitals, nine Asiatic hospitals, 28 native hospitals, and 11 isolation hospitals in the Protectorate. These provide beds for 27 Europeans, 51 Asiatics, and 1391 natives. In addition there are 97 beds in isolation hospitals which may be used for either Asiatics or natives. Grants are made by Government towards the cost of medical training of both native attendants and midwives at mission hospitals and maternity training schools.

Native Vital Statistics.

Perhaps the most outstanding feature of the year from the medical point of view is the position revealed regarding the vital statistics of the general native population. The figures for the death-, birth-, and infantile mortality-rates, and the excess of births over deaths, are in all cases better than they have ever been. It would appear that they reflect the advantage which has accrued to the general native population as a result of the intensive development of the organisation for their treatment at hospitals, dispensaries, and maternity centres which has taken place during recent

years. The first report of an excess of births over deaths in Buganda occurred in 1924 and was represented by the modest figure of 37. It was conjectured that the absence of serious epidemics was a factor in the improvement then recorded. The excess of births over deaths now reported for the five districts rendering returns is 17,000 and indicates that the position is being consolidated and that a progressive increase in the native population can now be confidently predicted. Syphilis, malaria, yaws, and ulcers are the four most common diseases of the country, in the order shown. Pneumonia, dysentery, and injuries account for the largest number of deaths in hospital. Plague and sleeping sickness required more attention than usual during the year.

The League of Nations International Sleeping Sickness Commission which assembled at Entebbe early in 1926 ceased its labours and was dissolved on June 30th, 1927. The results of the Commission's work will be of the utmost importance to African administration as well as to science. Experiments and investigations in connexion with human and animal trypanosomiasis are being actively continued at Entebbe under the direction of Dr. H. L. Duke, O.B.E., who served as chairman of the Commission, which has now been dissolved. A research institute is to be set up at Entebbe for the study of human trypanosomiasis.

Population and Climate.

For all practical purposes the Protectorate may be said to cover an area of approximately 94,204 square miles, of which 15,017 square miles is water. The population on Dec. 31st, 1927, was estimated to be 3,149,354—viz., 1867 Europeans, 11,502 Asiatics, and 3,135,985 natives. The climate of the Protectorate as a whole, though pleasant, cannot be considered healthy for Europeans. European children as a rule thrive in infancy, but considerable risk is attached to bringing them out when they are over 2 or 3 years old, as they are liable to attacks of malaria and resultant anæmia. The health of adults depends mainly on their mode of life, and, with care, constitutional health should not be impaired, but, even if physical fitness is maintained, the altitude and proximity to the Equator combine to produce nervous strain after prolonged residence. Outdoor manual labour is dangerous for Europeans, and on plantations a manager's or owner's duties are for the most part supervisory. The mean maximum temperature for most districts averages 80° F. and the mean minimum 60° F. On the Ruwenzori Range there is extreme cold with perpetual snow, and it is also cold on the higher slopes of Mount Elgon. In the Nile Valley, near Lake Albert, on the other hand, the mean maximum temperature is 90° F. and the mean minimum 74° F. The favourite localities for European plantations are the Buganda Province, the Toro district of the Western Province, and the Bunyora district of the Northern Province. Statistics taken at Entebbe give the following results: average rainfall for the last 32 years, 59·62 in.; average temperature for the last 27 years, maximum 78·7° F., minimum 62·8° F.; mean daily sunshine for 1927, 6 hrs. 12 min. The rainfall at Entebbe for the year, which was below the average, amounted to 53·73 in., distributed over 124 days.

CONFERENCE ON MATERNAL MORTALITY.

A CONFERENCE called by the Maternal Mortality Committee formed in 1927 by the initiative of Miss Gertrude Tuckwell, J.P., was held at the Central Hall, Westminster, on Oct. 30th. Lady Galway, who presided, said that the problem of maternal mortality and morbidity appealed both to emotion and to reason. It was important to collect information from social and medical workers, but it was equally important that the information should be mercilessly sifted and examined if we were not to be side-tracked. Mr. Neville Chamberlain dealt with three criticisms which had been made against the Ministry of Health. He said that (1) the Ministry had not really cut down the milk supplied to welfare centres nor instructed local authorities to reduce it; but when a reduction in expenditure had been called for from his department he had been obliged to decide between cutting down the milk grant and interfering with the development of normal health services. He had especially excluded the distressed mining areas and every local authority which was spending less than £100 a year on milk; to the rest he had been compelled to say, "You must supply what milk you think desirable, but this is all I can give from national resources." (2) Strong representations had been put forward that the National Health Insurance Act should be altered to provide medical and midwifery service before and after childbirth. An effort had been made to devise a scheme within the resources of the approved societies: it could, however, only be carried out by pooling their funds, and some of the societies refused to do this. (3) Fear had been expressed that the new system of block grants would lead to reduced help to voluntary societies, especially those working for unmarried m and their children. Though in future these societies be under the supervision of county and county b councils, all grants would be considered by the Minist would naturally have regard to what had been giver past. These points were warmly contested by sub speakers, great disappointment being expressed th Chamberlain had not been able to wait for the dis Dr. Marion Phillips said the cutting of the milk gr had a discouraging effect on local authorities in re other services. The sum saved was a small one, a the authorities had been told that it was a choice this small sum and expansion of health services Hubback pointed out that, by the block grant sys the money would be paid by one cheque, no part of earmarked, and there was no guarantee that a proportion would be spent on maternity and child or on health work at all. Such strong feeling was on the part of the conference that an additional re dealing with this point was put by Lady Galw carried. A report covering the proposals made at conference was presented by Dr. Marion Phillips. I had shown that of the county authorities supply information asked for only 61 out of 116 carried o than half their powers under the Maternity and Child Act. This was quite inadequate, and those who to citizen duties seriously should do all in their power public opinion.

INSTRUCTIONS FOR PATIENTS.

THE busy practitioner might save himself much he had ready a series of printed slips to hand to his explaining how to put on a fomentation, or douche t or wash the eye, and so forth. Dr. T. T. B. Watson on the idea of having such instructions printed on sheets with a perforated slip at the top which can in a "loose-leaf" holder. With each 25 of thes a folding cover is provided, bearing on the front and inside in some cases remarks intended for th titioner only. Having explained how a fomentation done, the doctor reaches for his holder labelled "f tions," and tears off a sheet to hand to the pati principle the idea can be both praised and critici certainly is useful to be able to reinforce the spok with a printed memorandum, and as long as the matter is confined to such examples as are mentione there is little room for differences of opinion. Other treated in the set of eight "instructions" already is more open to individual opinions. The intensive treatment of gastric and duodenal ulcer, diet in obe exercises for constipation, are all matters upon whi is some diversity of opinion and much room for var individual cases. It is, however, open to the doctor and alter such portions of the printed word as he Dr. Watson's instructions should prove extremely long as the doctor is watchful of the needs of in patients, and supplements or modifies them with me care. Messrs. H. K. Lewis and Co. publish the inst at 25 for 1s.

"PROPYL."

Mr. W. H. Martindale sends us a bottle of "I which is a surgical antiseptic, composed of iodine propyl alcohol, as described by Dr. R. A. Macdon Mr. J. Wycliffe Peck in our issue of Sept. 1st last The preparation is supplied in a distinctive bottl has some serviceable features. The bottle stands f aperture is semi-wide, making for quick pouring, stopper is of a sensible shape, excluding dust. Mr. dale tells us that five years ago he made a series of is tinctures and spirits (described in the 19th editio Extra Pharmacopœia, Vol. I., pp. 122-125), which e have no objectionable odours or vapours. This equally to the tincture of iodine (either strong c made with iso-propyl instead of ethyl alcohol.

Corrigenda.—In a leading article entitled Cardia lants in our issue of Oct. 20th line 20 of col. 1, p. 82 read "fall in blood pressure is not a result of cardiac

Mr. L. J. Harris and Mr. T. Moore point out that "hypercalcæmia" was misprinted "hyperglycæ the footnote to their letter on "Hypervitaminos "Vitamin Balance," in our last issue (Oct. 27th, p.

WE are informed that the address by Dr. Graha to which we referred last week in an annotatio Wisdom of Peter Harding, was delivered at th Institute of Public Health and not at the Ins Hygiene.

Schorstein Lecture

ON

EXPECTORATION.

Delivered at the London Hospital on Nov. 2nd, 1928,

BY CECIL WALL, D.M. OXF., F.R.C.P. LOND.,
PHYSICIAN TO THE HOSPITAL.

IN his Lumleian lectures last year Sir Charlton Briscoe [1] pointed out that the mechanical side of the respiratory mechanism has received less attention than it deserves. With this statement all those who devote special attention to diseases of the chest will be in agreement, and they will concur with him in the belief that the difficulty of the subject provides the explanation.

Briscoe combined experimental and clinical methods in a masterly manner in the endeavour to elucidate certain aspects of the subject. For many years my own work has afforded me numerous opportunities for the close clinical study of the muscular mechanism of respiration, but the problems which I have attempted to solve are different from those which he investigated, and my method has been perforce confined to the testing, by observation at the bedside, of a succession of hypotheses propounded by others or by myself. The problem which I propose to discuss to-day is that of the muscular mechanism of expectoration or, in the words of the late Dr. F. J. Smith, of the cough useful as opposed to the cough ornamental.

THE MECHANISM OF EXPECTORATION.

Expectoration is effected by raising the intra-pulmonary air pressure and then suddenly allowing the air to escape and carry with it any peccant matter that may be lying in the air passages. It follows, therefore, that the requisite modification of expiration must be preceded by inspiration, and to a great extent its mechanism will be modified by the position of the thorax at the commencement of the expiratory effort. The cavity of the thorax is enlarged during inspiration partly by descent of the diaphragm, working as Halls Dally [2] has shown as a piston works in a cylinder, and partly by the movement of the ribs. The older view, that the action of the diaphragm is due to the flattening of its curvature, seems to be now completely abandoned. However, it must be admitted with Keith [3] that, owing to the resistance of the abdominal viscera and to the situation of its attachments, the diaphragm in contracting tends not merely to lower the central tendon, but also to elevate and to some extent constrict the costal margin. This seems to be the obvious explanation of what is known as John Howard's experiment, on which Makuen, [4] apparently alone among authors, relies for his assertion that the diaphragm is an expiratory muscle. This experiment may be carried out as follows:—

> The hand is placed on the epigastrium while a forcible inhalation is made, the abdominal wall being pushed forward as the diaphragm contracts. If then at the end of the maximum inspiratory effort, while the breath is held, the diaphragm is allowed to relax and the abdominal wall to recede, more air can then be inspired as the lower ribs can now move further upwards and outwards.

The constricting action of the diaphragm is also proved by the observation originally made by Gerhardt [5] in 1860, and more recently confirmed by Pasteur, [6] that in diaphragmatic paralysis there is an increased movement of the lower ribs.

MOVEMENT OF THE RIBS.

The movement of the ribs has been the subject of much controversy since the view expounded by Galen in the second century—that the upper intercostals, both internal and external, lifted the ribs while the lower set depressed them—was disputed by Vesalius in the sixteenth century; and the controversy is evidently not yet settled, seeing that two standard English text-books of anatomy [7 8] adopt contrary views.

It is not possible for me to describe now the various views which have been held. I can but tell you the conclusions which I have reached by clinical observation. I will discuss first the movement of the ribs and then the muscles which accomplish the movement.

Keith [3] pointed out that only the first ten ribs take part in thoracic respiration, the eleventh and twelfth ribs, with their single articulations to the vertebral bodies, forming part of the abdominal wall. Following Keith again, the first ten ribs may be considered to form two groups. The first group consists of the first two pairs of ribs together with the manubrium sterni; this group, he said, constituted the "operculum thoracis." The second group consists of the third to the tenth pairs with their cartilages and the gladiolus of the sternum.

The first two ribs have a double articulation with the bodies of the vertebræ and with their transverse processes, but as the transverse processes are not set back far the hinge-joints permit an up-and-down or pump-handle movement with very little if any eversion. The four articular surfaces of each pair of ribs are not in a perfectly straight line, but as Volkmann showed, if the axes of the hinge-joints were produced forwards they would include an angle of about 135°. The result of this arrangement is that the operculum thoracis moves up and down in a manner comparable with the lid of a box on its hinges.

The movement of the second group of ribs is determined by the axes of the double costo-vertebral articulations. Passing downwards the transverse processes are set progressively further back, so that, to use Volkmann's measurements again, if the axes of the hinge-joints of the pairs of ribs be produced forwards they will intersect within the chest and include angles which diminish from above downwards until the included angle is a right angle or even less (88°). Furthermore, it must be pointed out that these axes of the hinge-joints are horizontal, and if produced forwards would meet the wall of the opposite side of the chest. The bony ribs being sharply curved and sloping downwards and forwards below the horizontal the posterior upward torsion of the rib, which puzzled Hutchinson [9] so much, seems to be a necessity.

It is admitted by all modern authorities, with the possible exception of the author of the *last edition* of Gray's "Anatomy," that the arrangement of these hinge-like costo-vertebral articulations only permits movement round the axis of the hinge—that the rib being curved moves like a bucket-handle and not like the handle of a pump. Hutchinson, [9] *in spite of the* meticulous care with which he investigated the anatomy of the thorax, did not realise this; he *speaks* of the ribs having two movements, the one up and down like a pump-handle, the other a movement of eversion which he thought was due to the *rotation* of the curved arc of the rib about its chord which he describes as joining the head with the anterior extremity. It does not appear to me to be mechanically possible for the ribs to execute the double movement, and furthermore clinical observation seems to demonstrate that it does not occur. Hamberger, [10] on the other hand, describes the movement correctly: "Each of the ten upper ribs," he says, "has its own fixed point on that line which can be drawn horizontally from the transverse process of the vertebra to a disc between the bodies of the two vertebræ with which the head of the rib articulates, and round this line the ribs move up and down."

If the chest of a healthy person be watched during inspiration it will be found that the body of the sternum does not swing forward markedly as it would if the ribs had a pump-handle action, but in moving upwards remains almost vertical, such movement being permitted by flexion of the angle of Louis. In certain abnormal conditions, for instance, when there is a funnel sternum or the *pericardium* is adherent to the sternum, the elevation of the ribs is accompanied not by an advance, but by actual recession of the

sternum. Again, if the ribs had this pump-handle movement the explanation of unilateral immobility of the thorax in pleurisy or pneumothorax would offer great difficulties.

I feel forced to adopt the view that the ribs have one movement only—that is, round the axes of their articulations with the bodies of the vertebræ and the transverse processes. The reason for the cartilages, and probably for the absence of the external interchondral muscles, seems to be found in the fact that the axes of rotation intersect within the thorax; if the anterior parts of the ribs were rigid the rotation of a pair of ribs about their axes would be mutually antagonistic, and this seems to be the case when pathological rigidity has supervened. The ribs are not horizontal, but slope downward; in inspiration they rotate upward. It is obvious that the more they slope downwards the less will be their perpendicular distance from the mid-line of the body, and the more nearly they approach the horizontal position the greater will be that distance; it is to this fact that the thoracic expansion in inspiration is due. As Luciani [15] shows, the point on the convexity of the rib through which passes a tangent parallel to the axis of rotation is the point which will rise most during the upward rotation of the ribs in inspiration. The obliquity of the axis will throw this point in front of the mid-line of the axilla.

Sewall and Pollard [10] claim to have demonstrated that costal respiration is more efficient than that effected by the diaphragm; over a long series of experiments measuring the vital capacity they found that if the diaphragm only was used for inspiration and expiration the average volume was 1341 c.cm., whereas if the ribs only were used the volume was 2139 c.cm. Mosso [11] found similarly that with thoracic respiration he inspired 2025 c.cm., whereas with abdominal respiration he inspired only 1350 c.cm.

MUSCULAR ACTION.

Great has been the controversy with regard to the movement of the ribs in respiration, but still greater and much more acrimonious has been the controversy with regard to the muscles causing the movement.

The view which seems to satisfy best my own observations is that originally expounded by Hamberger,[12] accepted with slight modifications by Hutchinson [9] and by many others including one of the most recent authorities, Sir Charlton Briscoe.[1] This view is that ordinary quiet inspiration is effected by contraction of the external intercostals acting in concert with the interchondrals of the opposite side of the chest, the fibres of the two muscles being parallel, and that ordinary quiet expiration is an active process brought about by contraction of the internal intercostals and the *triangularis sterni* (transversus thoracis and possibly morphologically representing the internal interchondrals) and aided by gravity and the elastic recoil of the resilient chest walls.

The chief rival view was originally put forward by Aranzi, of Bologna, and van Helmont, of Amsterdam, and was recently resuscitated by Sir Arthur Keith,[3] and has been adopted by the author of the last edition of Gray's "Anatomy." [8] These authorities hold that the function of the intercostal muscles is merely passive and designed to prevent the indrawing of the intercostal spaces during inspiration. An opinion with such weighty support cannot be dismissed summarily, but my objections to it seem insuperable.

In the first place, going back as far as Hamberger and Haller, it seems to me that Hamberger's mathematical argument is sound; if two parallel rods kept parallel, move about two fixed fulcra, and two elastic bands crossing each other at an angle are fixed to the two rods, it necessarily follows that as the two rods approach to and recede from the horizontal one band will be relaxed and the other will be stretched; it is not possible for the tension on the two bands to be altered equally and in the same direction. The ribs and the crossing fibres of the intercostal muscles are comparable with such rods and bands.

Next I am in sympathy with Haller's note of doubt sounded toward the end of his attack on Hamberger: "Why should there be two sets of intercostal muscles if indeed the function of each is the same?"

Thirdly, the experiment of Newell Martin,[12] which showed that the external intercostals contract synchronously with the diaphragm and the internal intercostals alternately, is not to be explained, as Keith suggests, as a result of the injury to the animal. Newell Martin was not an amateur or inexperienced investigator, and he found that the contractions synchronised or alternated with the contractions of the diaphragm and were not irregular, as would have been the case if injury were responsible. Furthermore, we find in the wards that lesions of the lower cervical cord which lead to paralysis of the intercostal nerves are associated with cessation of costal respiration, ventilation of the lungs being maintained by the action of the diaphragm.

Finally, if the intercostal muscles are not responsible for the movement of the ribs it becomes necessary to discover how they are moved.

The exponents of the passive theory do not specify the muscles concerned with costal respiration if the intercostals do not act. Muscles passing from the shoulder-girdle would be of but little value unless the shoulder-girdle were fixed. Therefore they must assume that the muscles passing from the spine or skull to the thoracic cage perform the function—e.g., scalenes, sternomastoids, levatores costarum. Keith agrees that the levatores costarum are lateral flexors of the spine and not important elevators of the ribs. It is not possible to investigate their activity clinically; but the scalenes and sternomastoids are accessible, and clinical observation gives frequent opportunities for investigating their contraction; with the finger in the suprascapular fossa or placed over the sternomastoid their contraction can be felt easily when the chest is rigid or in the full inspiratory position. For instance, when the thorax is raised during an attack of spasmodic asthma or in spontaneous pneumothorax, the activity of these muscles during inspiration is easily demonstrable, but unless there is unusual effort caused by some such condition as I have described evidence of their contraction is not forthcoming.

If the thorax can move freely even extraordinary inspiration does not seem to call into play the scalenes or sternomastoids; but when the chest is partly handicapped, as in an asthmatic between paroxysms, then an extra inspiratory effort may be found to call into action the extraordinary muscles of inspiration. In such cases, too, during inspiration we may feel the lumbar muscles contracting presumably to fix the lower ribs so as to give the diaphragm a fixed point on which to pull.

The arguments in favour of the external intercostals being the chief muscles of ordinary inspiration strongly favour the view that the internal intercostals and the *triangularis sterni* are the chief agents in ordinary expiration. Keith [3] has pointed out the improbability of expiration being merely the result of gravity and elastic recoil, and his view is in accord with the modern idea of the synergic action of muscles.

Expiration is much more closely under voluntary control than is inspiration. Speaking, singing, sneezing, coughing, are expiratory acts largely determined by the will, and it is possible by careful observation to arrive at some conclusion with regard to the muscles involved.

EXPIRATION.

Setting aside as fanciful Makuen's [4] idea that the diaphragm may have an expiratory function, we may consider how the diminution in the volume of the thorax is brought about. Elastic recoil and gravity undoubtedly play a part, but as expiration is not obviously hampered in a healthy person by inversion there must be other forces at work. Muscles other than the internal intercostals which by their contraction can depress the ribs and contract the thorax are superficial and their contraction can be felt. In ordinary expiration evidence of such contraction,

except perhaps in the case of the transversalis, is not forthcoming. It seems, therefore, fair to assume that the internal intercostals and triangularis sterni are the muscles chiefly concerned with quiet expiration.

Expiration has much more power than inspiration. Hutchinson [9] measured this in inches of water.

Inspiration.		Expiration.
1·5	Weak.	2·0
2·0	Ordinary.	2·5
2·5	Strong.	3·5
3·5	Very strong.	4·5
4·5	Remarkable.	5·8
5·5	Very remarkable.	7·0
6·0	Extraordinary.	8·5
7·0	Very extraordinary.	10·0

In forced expiration many muscles are called into play. The transversalis acts partly by compressing the abdominal viscera and so forcing the diaphragm upwards and partly by constricting the lower outlet of the thorax. When extra effort is required—for instance, in the act of coughing—all the muscles passing between the pelvis and thorax may be called into action. Of these the most important appear to be the recti and obliques together with the ilio-costalis and the pelvic portion of the latissimus dorsi, the contraction of which can often be seen and felt with the greatest ease. In extraordinary expiratory effort not merely is the thoracic outlet constricted, the diaphragm driven up, and the ribs depressed, but there is in addition a flexion of the thoracic and cervical spine to aid the depression of the ribs.

Clinical Applications.

This study of the muscular mechanism of expiration would have but little clinical value unless it were possible to make a practical application in the treatment of disease.

One of the simplest applications of our knowledge may be found in the dietetic treatment of chronic bronchitis or a tendency to recurrent bronchitis in a patient with abdominal obesity. The reduction of his girth will in many ways assist in the descent of the ribs and constriction of the thoracic outlet and so permit easy and beneficent expectoration. Another application may be found in the treatment of active hæmoptysis. Not infrequently in this condition we find the patient kept lying flat; in this position he is unable to cough and expectorate easily, and as a result with each gush of blood he starts up in bed and leans forward in order to get rid of it. This movement cannot be beneficial. It is far better to allow the patient to be in a semi-sitting position so that expectoration may be accomplished with the least effort. In addition, the effect of gravity in lowering the pulmonary blood pressure is probably advantageous by promoting clotting. Concomitant fainting may not be a disadvantage.

In the treatment of all kinds of cough associated with expectoration it is an advantage to allow the patient to sit so as to fix the pelvis and to bend the spine and neck forward so as to aid the depression of the ribs. If there is inspiratory difficulty at the same time the patient should lean on something firm so as to fix the shoulder-girdle and give the muscles of extraordinary inspiration a fixed point from which to act. The child with pertussis likes its mother to hold its head during the inspiratory whoop.

Operative Measures.

Within the last few years the method of paralysing one-half of the diaphragm by evulsion of the phrenic nerve has been used in the treatment of diseases of the lung. This operation has the effect of permitting partial collapse of the lung, the dome of the paralysed half reaching as high as the fourth or even the third costal cartilage as shown by radiography. During inspiration the failure of the diaphragm to descend checks the expansion of the apex of the corresponding lung while the costal movement still secures the expansion of the lower part and is to some extent facilitated by removal of an antagonistic force; the rest thus secured to the affected apex seems to explain the benefit following the operation in certain autotoxic cases of pulmonary tuberculosis.

It is not always sufficiently realised that the descent of the diaphragm is the chief cause of the expansion of the apex of the lung; radiographers are emphatic on this point, and perhaps it is due to this that the abdominal-breathing male is more commonly attacked by tuberculosis than the costal-breathing female.

Expiration is also modified by diaphragmatic paralysis. In the ordinary movements of quiet respiration there is not much difference to be noted, but with forced expiration—for instance, in coughing—the effect of abdominal constriction seems to be markedly enhanced, and to this seems attributable the benefit resulting from evulsion of the phrenic in basal bronchiectasis. In this condition the rise in the level of the diaphragm is not likely to lead to collapse of the thickened and rigid bronchial tubes, and in the majority of cases there is not much aerated lung tissue left. The undoubted improvement which frequently follows the operation must be attributed to the greater ease of expectoration which prevents the stagnation and decomposition of the secretions in the dilated tubes. The quantity of sputum may not be greatly diminished, but usually there is an early and marked reduction in the fœtor.

The operation of evulsion of the phrenic should be undertaken only after careful investigation of the muscular movements of respiration in the individual patient. If there is any difficulty in costal respiration paralysis of the diaphragm is likely to have serious results. A raised and rigid chest with respiration totally of the abdominal type would be an obvious contra-indication, but it seems necessary to exercise the greatest caution if the patient has to use such muscles as the scalenes in ordinary inspiration, and even if he calls them into action when taking a deep breath. I feel that this word of warning is necessary in spite of Lange's [14] statement that in elderly people, in whom diaphragmatic breathing more or less predominates, phrenicotomy does not lead to respiratory embarrassment.

The Raised and Rigid Chest.

How to aid the mechanism of coughing and expectoration when the chest is raised and rigid is a problem which is most difficult of solution. It is not infrequently held that the thorax becomes rigid owing to calcification of the costal cartilages. A study of radiograms of the chest shows that this is certainly not a complete explanation. The chest may be raised and rigid though there is no evidence of calcification; on the other hand, marked calcification is sometimes found in quite young persons whose costal movements are free. The chest may be raised and the ribs nearly horizontal, as in the so-called "artilleryman's chest" and in the child before puberty without any evidence of rigidity, and sometimes the chest may be rigid and moving as a whole, though the ribs are depressed and sloping. Sometimes—for instance, during an attack of spasmodic asthma—the raising of the chest and the inhibition of costal movement is only temporary, and again costal respiration may become impossible owing to some lesion of the lower cervical or upper dorsal region of the cord.

At times one is tempted to seek the cause of thoracic rigidity in some lesion of the costovertebral articulations, but unless there is evidence of spondylitis logical support of the speculation is seldom forthcoming. In all such conditions, however, a knowledge of the mechanism of expectoration may be of great assistance in reducing the discomfort of the patient.

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THE ULTIMATE RESULTS OF QUINIDINE THERAPY IN AURICULAR FIBRILLATION.

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THE observations of those who first used quinidine in the treatment of auricular fibrillation showed that normal rhythm could be restored in at least 50 per cent. of the cases treated. Soon, however, it became apparent that it was only in a much smaller number that normal rhythm was maintained. Some patients revert almost immediately to fibrillation, while others in whom sinus rhythm has persisted for weeks, months, or even years, eventually relapse. The mere restoration of normal rhythm is therefore no criterion of the value of quinidine as a practical therapeutic agent; and whether this drug will still be regarded as a useful remedy in years to come depends, not on its capacity to convert fibrillation to normal rhythm, but rather on considerations such as (1) the percentage of cases in which normal rhythm is more than a merely transient event, (2) the benefit which accrues from the restoration of normal rhythm, and (3) the dangers incidental to the use of quinidine. The sudden appearance of heart failure which frequently accompanies the onset of fibrillation is due, in part at least, to the increased heart rate. This can often be controlled by digitalis. So if quinidine is to "win its spurs" in the field of practical therapeutics, it must be shown that the condition of the patient in whom normal rhythm has been restored by its use is at least as good, if not better, than that of his fellow sufferer in whom the ventricular rate is held in check by digitalis.

Method of Investigation.

With a view to ascertaining the ultimate results of quinidine therapy we have followed up the after-histories of an unselected † group of patients treated with the drug in the Manchester Royal Infirmary during the past six years. When we first began to use quinidine we were groping in the dark, for we did not know in what type of case the drug was most likely to prove beneficial. Consequently, in the light of further experience, we should now regard some of our earlier cases as unsuitable, and would prefer to treat them with digitalis. Nevertheless it is instructive to consider the effects of quinidine in these cases, even if merely to emphasise the importance of judicious selection.

Chronic, as opposed to paroxysmal, auricular fibrillation is especially liable to occur in association with three pathogenic processes: (1) rheumatic infection of long standing, (2) degenerative myocardial fibrosis, and (3) thyroid intoxication. To the last of these we do not propose to refer in this paper, for the observations of F. R. Fraser [5] and his co-workers have shown that in this type of case normal rhythm can easily be restored and maintained, provided the source of the underlying toxæmia be first removed by adequate surgical measures, whereas, so long as hyperthyroidism persists, there is a strong tendency to relapse. Our own observations entirely corroborate Fraser's views.

It is not always easy to determine with certainty the ætiological factor in chronic fibrillation. The recognition of the thyrotoxic cases rarely presents much difficulty, but the hearsay evidence of supposed rheumatic infection is often unconvincing. Putting on one side the cases with a clear history of heart trouble dating from an attack of rheumatic fever or chorea in childhood, there remain those in which the signs of heart disease were first noticed in early adult life. These patients may, or may not, give a definite history of acute or subacute rheumatism. Some have mitral stenosis, while in others auscultation fails to reveal any sign of a valvular lesion. For the purpose of the present investigation we have regarded these cases as probably rheumatic, though we are bound to admit that the evidence on which the diagnosis rests is not always conclusive. Similarly, we have classified as "fibrotic" those in whom the cardiac symptoms appeared insidiously during the degenerative period of life.

Since our object is to ascertain what eventually happens to these patients, we have excluded from this survey all those who first came under treatment within the past two years. This leaves us with 27 cases, all of which have now been kept under observation continuously, so long as their rhythm remained normal—that is, say, for varying periods up to five years. We arbitrarily selected the period of two years, in the hope that by the end of that time the cardiac mechanism would have become sufficiently stable to afford a reliable guide to the more remote prognosis.

In the title of this paper we have used the words "ultimate results of quinidine therapy." To have done so is perhaps misleading, for the term ultimate suggests finality, and should therefore strictly be employed only in the case of those patients whose after-histories have been followed up to the time of their death. Our reason for choosing this title was to indicate that we were concerned not with the immediate, but with the more remote results of treatment, and we have included not only those patients who have died, but also those who are still living.

Classification of Results.

The classification adopted requires a word of explanation. We have divided our cases into two groups—"successful" and "unsuccessful." Each of these groups has again been subdivided. The successful group includes those patients who derived definite benefit for a considerable period of time from the restoration of normal rhythm. From a practical standpoint these cases may all be regarded as successful, though the measure of success which they achieve varies considerably. The most successful subgroup consists of those in whom normal rhythm was restored more than two years ago and who are still normal at the present time. Some of these have had relapses during the period of observation, but the normal mechanism has been easily restored by further courses of quinidine. Less successful are those who remained normal for two years or more (with or without relapses), but subsequently reverted to established fibrillation. We were at first inclined to regard these cases as unsuccessful, but the fact that they did derive definite and prolonged, though only temporary, benefit, seemed to justify their being considered as at any rate partially successful. The "unsuccessful" group includes (*a*) those patients in whom quinidine failed to produce normal rhythm, (*b*) those who

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† All patients in whom treatment was controlled electrocardiographically have been included.

DR. CECIL WALL: BIBLIOGRAPHY.

(*Continued from previous page.*)

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relapsed soon after the restoration of normal rhythm, and (c) those in whom normal rhythm was restored and maintained, but who died within a few months of discharge from hospital, or derived no obvious benefit therefrom. It must be recognised that there is no hard-and-fast line between these different groups. Probably some of the cases which failed to respond would have turned over if more quinidine had been given; but, in view of our experience that cases in which large doses of quinidine are required to produce normal rhythm tend to relapse, we did not feel justified in pushing the treatment farther. Similarly, some of the early relapses might have been prevented if the change to normal rhythm had been followed up by a larger "holding dose" of quinidine. On the other hand, there are the cases at present normal. There can, we are afraid, be little doubt that some of these will sooner or later revert permanently to fibrillation, and fail to respond to further courses of quinidine. Though fully conscious of its inherent defects, nevertheless we are inclined to think that a classification such as this does serve a useful purpose by helping to give some indication of the scope of quinidine therapy. Of our 22 rheumatic cases 7 failed to respond, 3 died within a few months of the restoration of normal rhythm, 1 died after maintaining normal rhythm for 19 months, 4 relapsed early, and the remaining 7 were "successful." Of the 5 cases in the fibrotic group 2 were "successful," 1 failed to respond, 1 relapsed early, and 1 died shortly after the restoration of normal rhythm.

A. *Successful.*

	Rheumatic.	Fibrotic.
1. Still normal	5	2
2. Normal for over two years ..	2	0
Total	7 (32%)	2 (40%)

B. *Unsuccessful.*

1. Failed to respond	7	1
2. Relapsed	4	1
3. Died	4	1
Total	15	3

It is interesting to compare these figures with those given by Hay [8] in his report of cases collected from members of the Cardiac Club in 1923. He divides his cases into two ‡ groups, according to whether fibrillation was, or was not, associated with valvular disease of the heart, and each group into three classes—(1) failures, (2) temporary successes, and (3) permanent successes. Hay's class 1 corresponds to our B1, his class 2 to our B2, and his class 3 § to our classes A1 and 2. His figures are as follows:—

	Group 1 (with "V.D.H.")	Group 2 (no "V.D.H.")
Class 1 (failures)	78	28
" 2 (temporary success) ..	42	24
" 3 (permanent ") ..	46 (27%)	35 (40·2%)
	166	87

Our figures are much too small to have any statistical value, but so far as they go, since most of the cases in Hay's group 1 were probably rheumatic, there is a fairly close agreement.

Group A. Successful Cases.

CASE 1.—A tramcar trolley boy, aged 18, was admitted to hospital in April, 1923, with rheumatic carditis, early mitral stenosis, and auricular fibrillation. 1·2 g. of quinidine restored normal rhythm, which has persisted ever since without further treatment. Since September, 1923, he has been working at a tram depôt 48 hours per week. In June, 1926, the heart was slightly enlarged with a systolic, and a short diastolic, murmur at the apex. His only spell off work during the whole of this period was three weeks in December, 1927, when he complained of "rheumatic" pains in the arms and abdomen.

CASE 2.—A commercial traveller, aged 38, was first seen in July, 1921, complaining of palpitation and pain in the chest of several weeks' duration. For some years he had had attacks of "palpitation" lasting for half an hour up to several hours. He had always been very active and played golf and lacrosse. There was a history of rheumatism as a child and scarlet fever in 1903. The heart was not enlarged, but its action was irregular and there was an apical systolic murmur. The electrocardiogram showed auricular fibrillation. In May, 1925, he was admitted and treated with quinidine. Six doses of 0·4 g. restored normal rhythm. This has been maintained without relapse up to the present date. Ventricular extrasystoles cause palpitation at times, chiefly at night. He is able to walk several miles daily, and to go upstairs without distress or shortness of breath.

CASE 3.—A motor driver, aged 41, was admitted to hospital in September, 1925, complaining of dyspnœa and pain in the stomach which troubled him chiefly at the end of his day's work. Dyspnœa had been present for a year and the "dyspepsia" for about five months. He had had bronchitis each winter for several years and two attacks of "influenza," the last in 1922. As a child he had chorea. Auricular fibrillation was present on admission and had probably existed for a year. The resting heart-rate was about 80 per minute. There was an accentuated first sound and a systolic murmur at the apex. The maximal impulse was in the fifth space in the mid-clavicular line, but the area of cardiac dullness was not increased to the right. Quinidine treatment was commenced on Oct. 7th and the heart became regular on the 9th, after six doses of 0·4 g.; 0·2 g. of quinidine was taken daily until October, 1927, when the patient had to be operated on for acute appendicitis. Since then he has had no quinidine, but nevertheless the cardiac mechanism has remained normal.

FIG. 1.

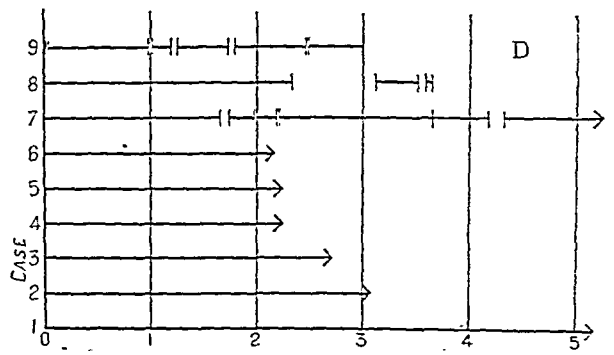


Diagram to show duration of normal rhythm in the nine "successful" cases. Breaks in the lines indicate relapses. An arrow indicates that the patient continued to exhibit normal rhythm, at the time this paper went to press. D (Case 9). This patient died 17 months after his final reversion to fibrillation.

CASE 4.—A pressman in a rubber factory, aged 31, was admitted to hospital in February, 1926, with dyspnœa and palpitation, which had troubled him since 1923 and had been worse for six months before admission, though he had been able to carry on his work until January. There was a history of sore-throats, but there had been no other rheumatic manifestations. He was refused for the Army in 1915 on account of V.D.H. On admission to hospital he was found to have mitral stenosis and auricular fibrillation. Quinidine was given from March 5th to 11th without success (total 4·6 g.). A second course on March 30th–31st, consisting of four doses of 0·4 g., restored normal rhythm, which has been maintained up to the present date. A daily holding dose of 0·2 g. has been given since normal rhythm was first restored. This patient was able to resume his work in April, 1926, and has worked continuously ever since. He now has dyspnœa only after unusual exertion.

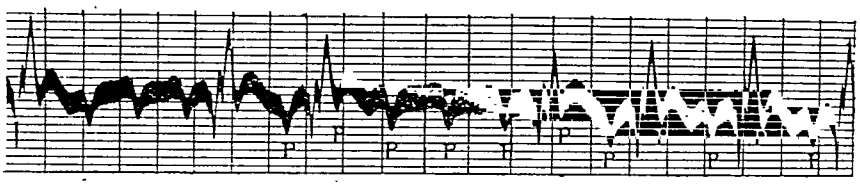
CASE 5.—A pattern maker, aged 59, was admitted to hospital in April, 1926, with orthopnœa and œdema of the legs. He had only left off work a few days previously. The heart was considerably enlarged to the left. Auricular fibrillation was present with an apical systolic murmur and a poor first sound, the second sound being accentuated at the base. The blood pressure was raised. There was no rheumatic history. A drachm of the tincture of digitalis was given every six hours for four days and smaller doses for the next week. This was followed by quinidine (0·8 g.) during the next two days, and normal rhythm was restored. He has not done any active work since discharge from hospital in May, 1926, but is able to enjoy a quiet life, and there has been no tendency to revert to fibrillation.

‡ With Mr. Hird (the thyrotoxic) group we are not concerned in this paper.

§ The patients we classified as B3 might have been in either class 2 or 3 of Hay's series.

CASE 6.—A carter, aged 62, who had previously had good health, was treated with quinidine sulphate in March, 1923, for auricular fibrillation, which had probably been present for six months, during which period he had been short of breath and had complained of some epigastric discomfort. There were no signs of congestion. The first sound was somewhat impure at the apex, and both sounds were faint at the base. 4·0 g. of quinidine, given during a period of four days, produced pure flutter (Fig. 2), and the drug was discontinued for ten days. Fibrillation returned (Fig. 3). 1·6 g. in a day then sufficed to produce normal rhythm, which was accompanied by a definite improvement in the subjective symptoms. In this case a diffuse rash of small red macules appeared on the chest, abdomen, and upper part of the back, after quinidine. It itched at first, but gradually faded and then ceased to cause trouble. Normal rhythm (Fig. 4) persisted for 20 months, and then auricular fibrillation recurred for no apparent reason, in spite of the fact that he was taking a small daily holding dose of quinidine. The drug was therefore increased (Fig. 5), and normal rhythm was restored in January, 1925, since when auricular fibrillation has recurred four times. In April, 1925, it was present for 24 hours. In June, 1925 (Fig. 6), it was present for five days following a cold, and in December, 1925, the patient reported that the heart had been irregular for a period of five hours, but had spontaneously returned to normal. On each of the other occasions normal rhythm was easily restored by quinidine. In May, 1926, the patient was able to get about without any symptoms of distress. Normal rhythm continued until June, 1927, when the pulse became irregular owing to sino-auricular block (Fig. 7), and a week later fibrillation (Fig. 8) again developed, the quinidine having been omitted for some days. Seven weeks later, when quinidine was resumed, normal rhythm (Fig. 9) was restored and has since been maintained in spite of an attack of bronchitis in the early part of this year.

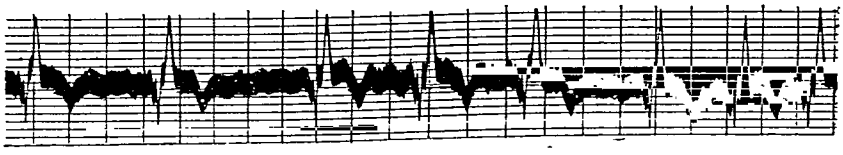
FIG. 2.



(This figure and Figs. 3 to 8 all refer to Case 6.)
March 23rd, 1923. Chest lead after first course of quinidine showing pure flutter with varying 2 : 1, 4 : 1 block. P = auricular complex.

This case is of particular interest, for the relapses have afforded repeated opportunities for comparing the general condition during fibrillation and sinus rhythm. The patient, who is an intelligent and observant man, is most emphatic about the relief which on each occasion has accompanied the restoration of the normal mechanism. There is a second reason why this case is worthy of notice. It is one in which we did not expect to obtain a successful result. An elderly man, the ventricular complex of whose electrocardiogram (Figs. 2–8) is strikingly abnormal, could hardly have been regarded as a favourable subject. In fact the only redeeming feature—and one to which hitherto we have probably not attached sufficient importance—was the absence of congestive heart failure. The success in this case tempts one to give quinidine a trial in some of the other "fibrotic" cases which hitherto we have passed over as unsuitable.

FIG. 3.



March 26th, 1923. Chest lead showing fibrillation.

CASE 7.—A mission secretary, aged 40, was admitted in February, 1926, with rheumatic carditis, congestive heart failure, and auricular fibrillation. His cardiac symptoms dated from an attack of chorea at the age of 11. Digitalis was given for four weeks, by which time all signs of failure had disappeared. A course of quinidine treatment was commenced on March 24th, and two days later, after 2·4 g. of the drug had been taken, the heart's action became regular, except for occasional extrasystoles. A week later the patient had acute pain in the region of the spleen, suggestive of infarction, and was slightly jaundiced. This quickly cleared up and did not upset the heart mechanism. The quinidine was reduced until 0·2 g. was being taken daily, and gr. 1/600 of Nativelle's digitalin every other day. This was continued until June, 1927. He was able to carry on his work till December, 1927, when attacks of palpitation and dyspnœa became troublesome on more than mild exertion. In February, 1928, he had to go to bed for two weeks on account of the dyspnœa, and has been in bed a few days since then. When last seen in June of this year the heart rhythm was normal and he was continuing to take 0·2 g. of quinidine daily.

CASE 8.—A working-class woman, aged 26, whose cardiac lesion dated from an attack of rheumatic fever in childhood, developed auricular fibrillation during a subsequent rheumatic attack, following confinement. When first seen she had advanced mitral stenosis with enlargement of the liver. Normal rhythm was restored by 1·0 g. of quinidine in June, 1923, and maintained for over two years, despite the birth of a full-time child (fourth pregnancy). A fifth pregnancy, however, had to be terminated at three months, in September, 1925, owing to heart failure associated with the recurrence of fibrillation. Two short courses of quinidine at that time failed to restore normal rhythm. She was readmitted in July, 1926, and quinidine was again administered. The first course of 0·8 g. caused vomiting, but four days later 2·0 g. restored normal rhythm which was maintained for five months. In January, 1927, a further course of quinidine (4·8 g.) once more restored normal rhythm, and a daily holding dose of 0·4 g. was given. From January to the end of February, 1927, auricular fibrillation and flutter occurred in paroxysms, finally giving way to continued fibrillation which has persisted. Since reversion to fibrillation, 15 months ago, it has been possible efficiently to control the ventricular rate with digitalis. This patient is able to carry on her full household duties, though her exercise tolerance is not quite so good as it was during the first long spell of normal rhythm. Her heart is now greatly enlarged, and radiographic examination shows that the shadow of the left auricle forms part of the right border of the heart (Fig. 9). This case illustrates a sequence of events which one might reasonably anticipate when the cardiac lesion is progressive. After each relapse a larger dose of quinidine was required to restore normal rhythm, and the subsequent relapses tended to follow more quickly. In this case we had hopes of obtaining a permanently successful result, but were doomed to disappointment. The fact that normal rhythm was maintained throughout pregnancy and labour seemed most promising, but apparently the cardiac lesion was progressive and eventually got the upper hand.

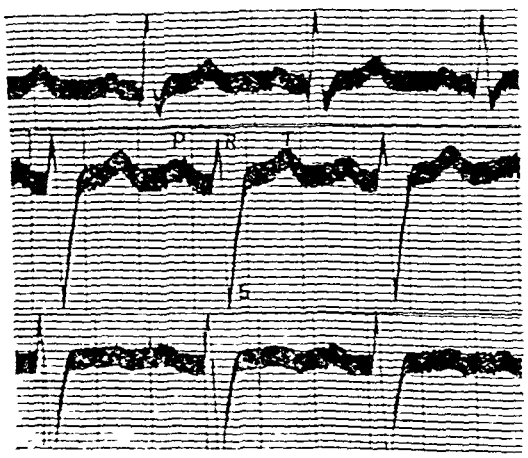
CASE 9.—A general labourer, aged 35, was admitted to hospital in August, 1923, with slight cardiac enlargement, auricular fibrillation, mitral stenosis, and aortic incompetence. He had been invalided out of the army with rheumatism seven years previously. His liver was enlarged and tender. Normal rhythm was restored after two courses of quinidine of 4·0 g. and 7·2 g. respectively, and maintained for a year with one relapse lasting 12 days. The second attack of fibrillation again produced epigastric tenderness. Normal rhythm was restored and maintained for two months with a relapse of two days. A third time normal rhythm was restored and held for six months, and a fourth time for eight months. After another relapse lasting ten days normal rhythm was again restored and held for six months. In all normal rhythm was maintained for three years, though there were six relapses of short duration, each accompanied by signs of cardiac failure and epigastric tenderness. After the sixth return to auricular fibrillation in September, 1926, quinidine failed to restore the normal

rhythm, in spite of five courses of treatment totalling 30 g. of the drug. In March, 1927, he was ill for three weeks at home and was then readmitted to hospital with embolic hemiplegia. In April he was discharged much improved, but still fibrillating, and was able to do light work until January, 1928, when he died after 36 hours' illness. The repeated relapses in this case appeared to be associated with emotional disturbances to which the patient was unduly susceptible.

Beneficial Effects.

In the majority of cases the restoration of normal rhythm seems to benefit the patient in two ways. He feels more comfortable—he is no longer conscious that he has a heart—and his tolerance for exercise is increased. Blumgart's[1] observations show that whereas digitalis is capable of controlling the resting ventricular rate in patients suffering from fibrillation, it fails to protect the ventricles from the exaggerated response to exercise, for, although the maximum rate attained on exertion is lower, the actual increase in rate is even greater than in the patient who has not taken digitalis. If this were the whole story, it would be easy to understand why the restoration of normal rhythm should increase the tolerance for exercise; but Blumgart goes on to point out that the heart in which normal rhythm has been restored by quinidine exhibits the same type of response to exercise as it did previously. If this be so, one is bound to conclude that the abnormal response to exercise is due, not to the abnormal rhythm but, to some other factor, probably the associated myocardial insufficiency. We cannot

FIG. 4.



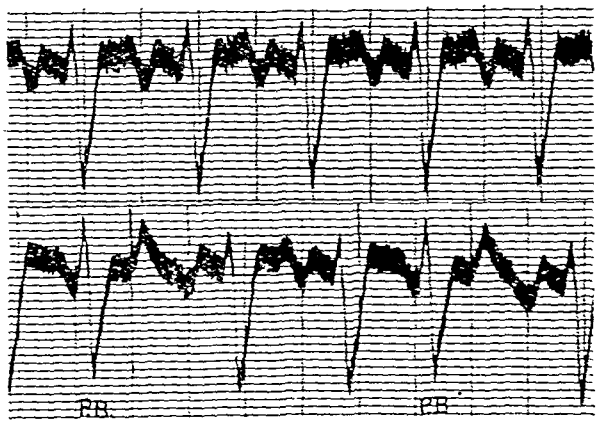
May 27th, 1924. Leads I, II, and III, showing sinus rhythm. The spreading, slurring, and large amplitude of the Q.R.S. complex is suggestive of impaired conductivity in the right branch of the auriculo-ventricular bundle. These features have remained practically unaltered during the five years that the patient has been under observation. The smaller amplitude of the deflexions in some of the later records is accounted for by the fact that these were taken at the standard sensitivity but with a lower magnification—i.e., with the camera closer to the galvanometer, so that an E.M.F. of 3 millivolts gives a deflexion of less than 30 mm.

express any opinion on this point, for we have not recorded the heart rate after exercise in our patients. But we have no hesitation in saying that, in the "successful" cases in our series, the patients have been able to lead a more active life than they could before the restoration of normal rhythm. Clark-Kennedy[3] came to the same conclusion. He stated that, in his series, sino-auricular (S.A.) rhythm raised the cardiac efficiency to a higher level than when auricular fibrillation was present, and the ventricular rate controlled by digitalis.

Group B.1. Complete Failures.

Tachycardia.—Of the eight cases in which quinidine failed to restore normal rhythm the treatment had to be abandoned on account of toxic symptoms in three instances. A woman of 31 (Case 10) with a rheumatic mitral stenosis and congestive heart failure, developed distressing palpitation on two occasions after a single dose of 0·2 g. The same was true of another woman (Case 11) who at the time showed no signs of heart

FIG. 5.



Dec. 5th, 1924, lead II. Both records show pure flutter with a 2:1 block. The irregularity in the lower record is due to the presence of frequent premature beats (P.B.), each of which is followed by a compensatory pause. This type of arrhythmia in which the flutter was complicated by premature beats of supra-ventricular origin was observed on three occasions in this patient during the transition from fibrillation to sinus rhythm.

failure. Both these patients subsequently died from cerebral embolism, the former three months and the latter three years after discharge from hospital.

Palpitation is a toxic symptom which has been noted by most workers, and may be sufficiently severe to render further treatment inadvisable. Levy[10] records two cases of heart failure which he considers were directly attributable to ventricular tachycardia. Parkinson and Nicholl[11] reported four cases in which signs of acute heart failure followed quinidine, but they suggest that this may have been due, not merely to the tachycardia but to a prejudicial effect of the drug on the myocardium. Frey[6] and others have reported instances of sudden, though only temporary, collapse with loss of consciousness and failure of respiration, and Clark-Kennedy[3] observed cerebral symptoms with partial or complete loss of consciousness in three of his cases.

In a man of 37 (Case 12), with no rheumatic history, treated in 1923, 13 g. of quinidine failed to restore normal rhythm and the drug had to be discontinued on account of headache and abdominal pain. This patient's condition does not appear to have become any worse, and for the past four years he has been able to carry on his work as a tinsmith.

Embolism.—In one of our early cases (Case 13), a woman of 46 with orthopnœa and œdema, cerebral embolism occurred shortly after the commencement of a course of quinidine treatment. The fact, however, that fibrillation was still present suggests that the quinidine may not have been any more to blame for this accident than for the similar catastrophe in the two cases in which the drug had been discontinued on account of palpitation. The only other case in our series in which embolism occurred while the drug was being given was Case 7, in which the resumption of normal rhythm probably was instrumental in producing splenic infarction, which, however, led to no serious results. Embolic phenomena are so common in old-standing cases of fibrillation, as is shown even in the present small series, that we are inclined to think that quinidine does not deserve all the blame it has received in this respect.

If the resumption of auricular contraction were responsible for dislodging a thrombus, one would

expect embolism to occur most frequently at the time, or at any rate very soon after the restoration of sinus rhythm; but experience does not bear this out. Viko, Marvin, and White [12] found that in 452 cases treated with quinidine the incidence of embolism was no higher than in 200 control cases in which it had not been given.

In a woman of 32 (Case 14) with cardiac enlargement and mitral stenosis but no œdema, three courses of quinidine failed to restore normal rhythm. Her condition has become slowly worse during the past four years. In a man of 36 (Case 15) with mitral stenosis and dyspnœa on exertion, fibrillation was converted to 2 : 1 flutter by two courses of quinidine; but he failed to develop normal rhythm, and subsequently relapsed to fibrillation. His condition four years later remains practically unchanged. In a labourer (Case 16) of 32 with aortic incompetence, mitral stenosis, and considerable cardiac enlargement, who had rheumatic fever in 1916, large doses of quinidine failed to restore normal rhythm. During the past three years he has been treated with digitalis and his cardiac condition has shown little change.

CASE 17.—*A salesman, aged 33, who three months* previously had been able to play tennis, was admitted to hospital in 1925 with mitral stenosis, aortic incompetence, and auricular fibrillation, but no signs of heart failure. There was a definite rheumatic history. Two courses of quinidine failed to restore normal rhythm, but digitalis sufficed to control the heart-rate and he was able to follow his occupation, which was not strenuous, until May, 1928, when he died after a short illness.

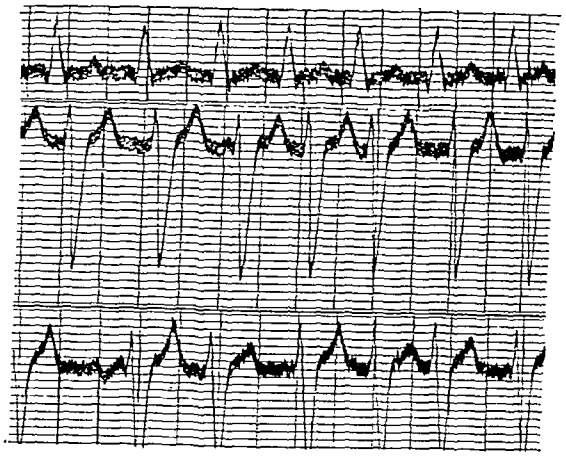
Ventricular Fibrillation.—Hay [8] in his series of 286 cases, which includes not only fibrillation but also flutter and paroxysmal tachycardia, records eight cases of sudden death which did not appear to be due to embolism. One of us has seen elsewhere a case in which it seemed probable that quinidine had caused sudden death by producing ventricular fibrillation. This, fortunately, is an extremely uncommon occurrence. Here again it is not possible to be certain that the drug has been responsible for the catastrophe, since ventricular fibrillation does occur spontaneously in patients who have never been treated with quinidine. An instance in point has recently been reported by one of us.[2] The patient was a man of 25, with old-standing rheumatic carditis, auricular fibrillation, and extreme dilatation of the left auricle. He was being treated by rest in bed with small doses of digitalis, and appeared to be making very satisfactory progress. Five days after admission to hospital, when using the bed-pan, suddenly and without warning he collapsed, and died within five minutes. Autopsy failed to reveal the cause of death. The general condition of this patient during the period he was in hospital was apparently so satisfactory that, if his sudden and unexpected collapse had followed the administration of quinidine, one would have been tempted to attribute it to the use of that drug. Since he never had quinidine, this contingency does not arise, but it leads one to question the validity of the evidence on which quinidine is sometimes blamed for bringing about a fatal issue in cases of auricular fibrillation in which no sufficient cause of death can be found post mortem.

Group B2. Relapses.

In the following cases the restoration of normal rhythm proved to be no more than a merely transient affair.

CASE 18.—A clog sole cutter, aged 42, who had had rheumatic fever in 1903, began to suffer from shortness of breath on exertion in April, 1921. He was admitted to hospital in February, 1922, with auricular fibrillation, but no evidence of cardiac enlargement nor of any valvular lesion. 2·4 g. of quinidine produced pure flutter. Auricular fibrillation recurred when the drug was discontinued. A second course of quinidine again produced flutter, but normal rhythm supervened after 4·6 g., and persisted for a fortnight. This patient refused further treatment since the quinidine provoked headache and abdominal discomfort.

FIG. 7.

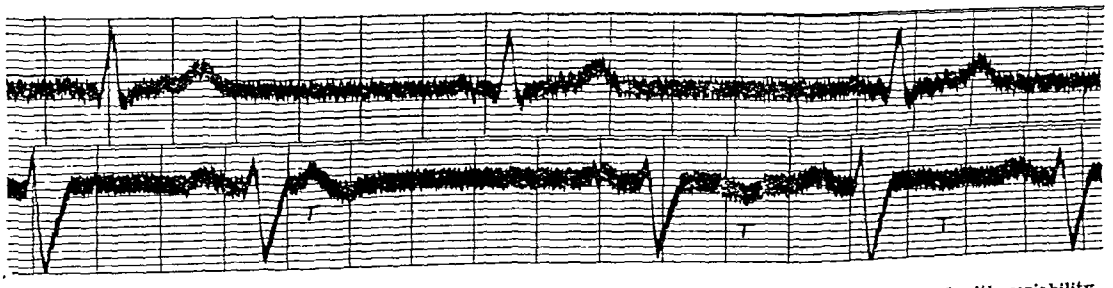


June 26th, 1927. Leads I, II, and III. Auricular fibrillation with a ventricular rate of about 140 per minute.

CASE 19.—A hatter, aged 58, was admitted to hospital in October, 1925. There was a history of rheumatism at the age of 38. The heart was not enlarged and there were no signs of cardiac failure, but he had auricular fibrillation and mitral stenosis. Six doses of quinidine sulphate totalling 2·4 g. restored normal rhythm. No holding dose was given. In this case it is not possible to say how long sinus rhythm was maintained as the patient was not seen till readmission to hospital a year later, when auricular fibrillation was present together with signs of cardiac failure. He improved with digitalis treatment, but on this occasion quinidine was not given. Since then he has been unable to work, partly on account of his cardiac disability, but chiefly because he is not mentally capable.

CASE 20.—A cotton overlooker, aged 37, was admitted to hospital with auricular fibrillation in February, 1926. There was a history of rheumatic fever at the age of 11, but there was no obvious valvular lesion and no cardiac enlargement. 3·0 g. of quinidine restored normal rhythm,

FIG. 6.

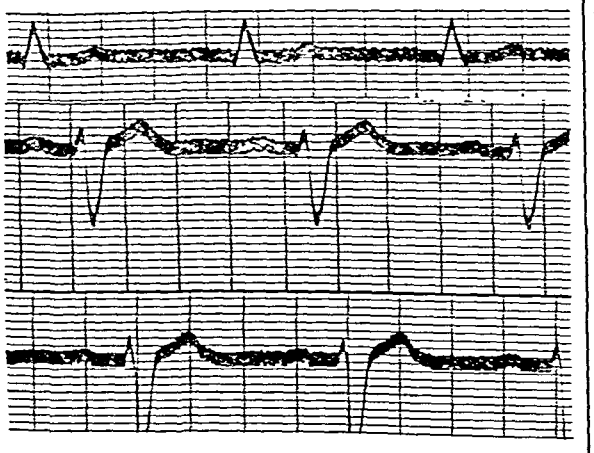


June 17th, 1927. Leads I and II, showing sino-auricular block. The irregularity in lead II is associated with variability in the form of the T-wave.

which only held for a week. A second course of quinidine was given and 2·0 g. again restored normal rhythm; this was maintained with a daily dose of 0·2 g. till his discharge on March 20th, when the fibrillation returned and has persisted to the present date. Since leaving hospital he has been able to follow his occupation, but during the past year he has found the work rather strenuous and has required to have periodic rests to relieve the palpitation, dyspnœa, and precordial pain which develop when he is tired.

CASE 21.—A clerk, aged 55, was admitted to hospital in October, 1924, complaining of palpitation and loss of mental

FIG. 8.



June 1st, 1928. Leads I, II, and III. Sinus rhythm.

concentration. Dizziness had been present for four months. As a child he had been subject to frequent "sore throats." On admission he was found to have mitral stenosis, auricular fibrillation, with slight enlargement and tenderness of the liver. Quinidine (0·4 g.) was administered twice daily from Oct. 7th to 9th, and sinus rhythm was restored after the third dose. The dose was reduced to 0·2 g. daily until the 23rd and was then reduced to 0·1 g. daily. The patient's transference to another ward on Oct. 27th coincided with reversion to fibrillation, but further treatment with 0·4 g. quinidine twice daily again restored normal rhythm after six doses. His condition improved considerably and he was allowed to go home on Nov. 5th. Fibrillation returned soon after discharge, but he was able to work for a short time. On Dec. 27th he developed an embolic hemiplegia and died a week later.

CASE 22.—A married woman, aged 48, was admitted in March, 1926, with pain in the lumbar region and dyspnœa of three years' duration. The heart was slightly enlarged to the left, but the sounds were good, and there was a soft apical systolic murmur. Apart from auricular fibrillation no other abnormal signs were present. Quinidine was given for four days without success. Five days later normal rhythm was restored after 2·8 g. of quinidine. A holding dose of 0·1 g. twice daily was given until discharge at the end of the month, and was ordered to be continued. The patient did not attend for further treatment, and fibrillation recurred soon after leaving hospital. Restoration of normal rhythm did not appear to benefit this woman, and she has continued in good health without further treatment. She was last seen in March, 1928, when the fibrillation was still present. The pulse-rate was 80, the first sound was blurred at the apex, but elsewhere both sounds were clear. There was no cardiac enlargement nor œdema. She was not having any treatment.

Group B3. Little or no Benefit from the Restoration of Normal Rhythm.

Four patients in whom the restoration of normal rhythm was unaccompanied by any obvious improvement in their general condition, all died within seven months of discharge from hospital. The one remaining patient in this group (Case 24) lived for 19 months.

CASE 23.—A machinist, aged 50, with old-standing rheumatic carditis and mitral stenosis became normal in June, 1926, after six doses of 0·4 g. of quinidine. A daily holding dose of 0·4 g. was given. On discharge from hospital she was able to resume her work, but in November, 1926, she had an attack of acute pleurisy. After this she rapidly lost ground and died in January, 1927.

CASE 24.—A married woman, aged 31, who had been short of breath for 15 years, and getting worse during the last 12 months, was admitted to hospital with mitral stenosis and auricular fibrillation. The heart was slightly enlarged, and the liver was just palpable. In April, 1925, 3·0 g. of quinidine were given without success. A second course of 4·0 g. four days later restored normal rhythm. Two weeks later she was allowed to get up, and felt much better. She was able to walk about without distress. In July there was a brief relapse to auricular fibrillation, in spite of a daily dose of quinidine. Normal rhythm returned, however, without increasing the dose and was maintained until the end of 1926, when she took a turn for the worse and died early in January, 1927.

This is a border-line case which might have been regarded as successful for a short period of time.

CASE 25.—In a woman, aged 29, who had suffered from dyspnœa for five years, 2·8 g. of quinidine restored the normal rhythm, but the patient refused further treatment owing to headache and nausea. Her heart was greatly enlarged, but there was no venous congestion nor œdema. Shortly afterwards the patient returned home and died within a few weeks.

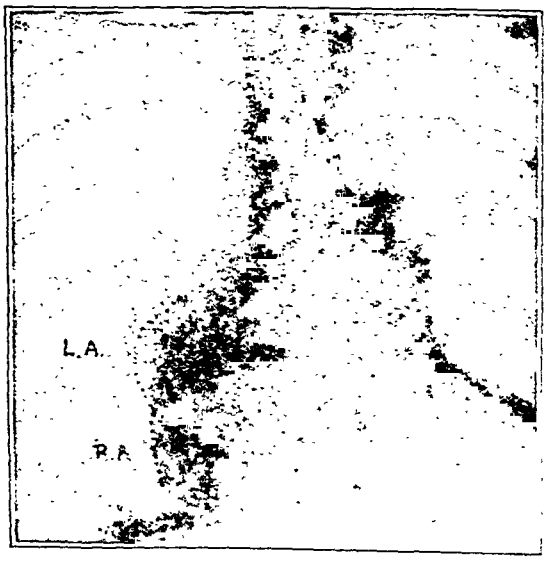
CASE 26.—A fruiterer, aged 26, with mitral stenosis and moderate cardiac enlargement, turned from auricular fibrillation into auricular flutter with 1·2 g. of quinidine. A further 1·6 g. restored the normal mechanism which persisted till death a month later.

CASE 27.—A mechanic, aged 42, was admitted in January, 1925, with chronic interstitial nephritis and auricular fibrillation. There was a six months' cardiac history. After three weeks' rest in bed and treatment with digitalis, quinidine was given. Three doses of 0·4 g. restored normal rhythm, and this was maintained. By the end of February all signs of cardiac failure had disappeared and he was able to walk about. He went home, still taking quinidine daily, but died seven weeks later from uræmia. The pulse remained regular to the end.

Paroxysmal Auricular Fibrillation.

We have made no reference in this paper to the use of quinidine in paroxysmal fibrillation. In conditions such as this, where the attacks occur at irregular

FIG. 9.



Radiogram of chest in Case 8. L.A. = Shadow of left auricle. R.A. = Shadow of right auricle.

intervals, vary in duration, and terminate spontaneously, it is exceedingly difficult to assess with any certainty the value of the therapeutic agents which have been employed. Parkinson and Nicholl reported beneficial effects in three out of five cases under their care. As they say, one would naturally expect that a drug which can abolish established fibrillation would be likely to ward off, or at any rate to reduce the frequency of, attacks in the paroxysmal form of the disorder. We are inclined to think that

the reason why quinidine is not more uniformly successful in this type of case is that there are two distinct varieties of paroxysmal auricular fibrillation, the one a mere precursor of the established condition, the other a derangement of the cardiac mechanism, which shows little or no tendency to become permanent, and is more closely allied to true paroxysmal tachycardia. In one such case which we have now had under observation for six years, during which period attacks have occurred about once a fortnight, quinidine was given daily in varying doses for 12 months. It failed to produce any obvious effect, either on the duration or on the frequency of the attacks; but, since this case raises several issues which do not come within the scope of the present paper, we do not propose to refer to it in detail here.

Method of Administering Quinidine.

We have from time to time modified our technique in the administration of quinidine both as regards the total quantity given per diem and the interval between successive doses. The method which we now generally adopt is, first having got the patient fully digitalised, to give a preliminary dose of 0·2 g. of quinidine to exclude the possibility of an idiosyncrasy to the drug. Twenty-four hours later 0·4 g. is given in the form of a cachet, and this is repeated every two hours for five doses, or until normal rhythm returns. If necessary another five doses are given on each of the two succeeding days. Generally, however, sinus rhythm is restored on the first day.

The after-treatment of patients who respond to quinidine is a subject about which opinion is divided. Emanuel [4] stated that he had found no advantage in persevering with small doses of quinidine after sinus rhythm had once been established. Hay [7] expressed a similar opinion in his first paper, but in his report [8] of the collective experience of members of the Cardiac Club he states that the general opinion seems to be in favour of giving the drug for some time after the restoration of normal rhythm. Fraser [5] considers that it is probably advisable in all cases to continue giving quinidine for some weeks after normal rhythm has resulted, though in gradually decreasing doses. Clark-Kennedy [3] is of opinion that discontinuation of the drug generally leads to relapse. We are inclined to think that no one line of treatment is suitable for all cases. The tendency to relapse is much more pronounced in some cases than in others. The two extremes are represented on the one hand by patients like our Case 1, in which no holding dose was given and sinus rhythm has persisted for five years, and on the other by cases such as those in Group B2, which persistently relapse in spite of a holding dose. To carry the contrast a step further, there are people with healthy auricles which never have fibrillated, and are never likely to fibrillate, while there are others who have fibrillated for some time and will in all probability go on fibrillating for the rest of their lives, and in whom sinus rhythm cannot be restored. The former have no need for quinidine, while in the latter it achieves no result. There are, however, a large number of cases which lie between these two extremes. It is in them that after-treatment with quinidine is likely to hold the balance between fibrillation and normal rhythm and to prevent relapse. On this hypothesis we have based the routine treatment which we now employ. When normal rhythm is first restored we give no holding dose, for if it should prove unnecessary so much the better. When, however, the first relapse occurs we give a holding dose of 0·4 g. per diem for a month or six weeks, and half that dose for the next two or three months. In the event of a subsequent relapse the quinidine is continued indefinitely in such quantity as appears necessary to maintain sinus rhythm.

Summary.

In an unselected series of 27 hospital cases of auricular fibrillation, all of which were first treated with quinidine more than two years ago, definite and lasting benefit was obtained in nine instances. In 8 cases the drug failed to produce normal rhythm, and in the remaining 10 cases though fibrillation was arrested, either the restoration of the normal mechanism proved to be a merely transient event, or the patient derived no definite benefit therefrom. In 5 cases the ætiological factor appeared to be a chronic myocardial fibrosis, and in the remaining 22 the cardiac lesion was definitely or probably rheumatic.

Some of the dangers of quinidine therapy are considered and the method of administration is discussed.

We are indebted to the other members of the staff of the Manchester Royal Infirmary for permission to study and to follow up the after-histories of cases under their care in the hospital; and we should also like to acknowledge the help which we received in the earlier part of this investigation from Dr. Sylvia K. Hickson.

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ACTION OF RADIATION ON BLOOD-SUPPLY OF TUMOURS.

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So much attention has been paid to the direct action of radiation on tumour cells that its other effects on tumours have been neglected. Previous papers have brought forward experimental evidence to show that the action of radiation on blood-vessels and on blood-supply is very important, and that it will explain many experimental and clinical findings, besides giving a useful working hypothesis for therapy. In the present paper I insist once more on the importance of the effect on the blood-supply when irradiating living tissues or tumours. The difference between the exposure of tumours in vitro and in vivo has been dealt with.[1] When tumour cells are left in the body after exposure in vivo they suffer from the damaging effect of a lessened blood-supply as well as from the direct action of the radiation, and so are more easily destroyed than when removed at once and implanted into another animal, where they do not suffer from any disturbance of blood-supply. The dose of radiation can be adjusted so that the cells die when implanted four or five days after exposure, whereas they live when implanted at once. This difference was shown to be associated with an interference with the blood-supply occurring four to five days after exposure. Thus two actions of radiation were differentiated: (*a*) direct destructive action on the tumour cells, and (*b*) indirect damage from an interference with the blood-supply.

The experiments here described deal with the difference between the susceptibility of fast- and slow-growing tumours. Clinically, fast-growing tumours appear to be more susceptible than slow. Experiments were made in vitro to see whether this was true under experimental conditions. Four tumours were chosen: the fast-growing Jensen's rat sarcoma (J.R.S.), the slow-growing rat sarcoma No. 35, the fast-growing mouse carcinoma T/63, and the slow-growing mouse carcinoma "Twort." Pieces of tumour approximately 1 c.mm. in size were placed between sheets of mica 0·04 mm. thick and exposed to a radium applicator. The applicator used throughout these experiments was 110 mg. $RaBr_2 4H_2O$,

area 2×2 cm., screen 0·12 mm. silver. The pieces were then inoculated into the flanks of animals, control unradiated pieces being placed in the opposite flanks. The results are given in Table I.

The figures show that there is no decided difference in susceptibility between tumour cells from fast- and slow-growing tumours; the slow-growing tumours are a little more susceptible than the fast, the lethal doses being 30 as against 40 minutes for the sarcomas, and 25 as against 30 for the carcinomas. If, therefore, fast-growing tumours are clinically more susceptible the difference is not due to any difference in the susceptibility of the tumour cells. Similar results occur if the tumour cells are exposed in the living animal, removed immediately after exposure and tested in the same way.

FIG. 1.

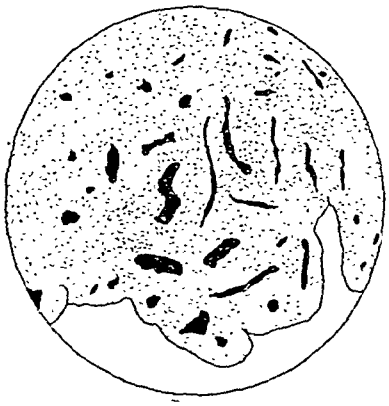


FIG. 2.

Diameter of field = 0·93 mm. Stippled areas = tumour; black areas = blood-vessels; Fig. 1 = T/63; Fig. 2 = Twort; Fig. 3 = slow-growing sarcoma; Fig. 4 = J.R.S.

Fast-growing Tumours more Susceptible in Vivo.

Experiments in vivo were next carried out. Animals were inoculated in both flanks with pieces of tumour approximately a cubic millimetre in size. The resulting tumours were repeatedly measured, and when one of them had grown to 5×5 or 6×4 mm. of superficial area it was irradiated. The other tumour served as a control; its growth was watched and if it did not grow progressively the animal was discarded. Thus, by using only animals in which the control tumours grew progressively, all effects of immunity were avoided. The radiated tumours were measured thrice a week to see whether they disappeared or not. The results are given in Table II.

In contrast to the previous results a large difference in susceptibility is here seen; the fast-growing tumours are far more easily destroyed. Here the conditions of radiation are much more favourable for the survival of the tumour cells than in the experiments summarised in Table I. In the experiments in vitro the tumour material was only 1 mm. thick and was separated from the radium by only a thin sheet of mica, whereas in the experiments in vivo the tumours were approximately 5 mm. thick and separated from the radium by the skin and subcutaneous tissues. Other things being equal, the dose required to destroy the tumour cells should be much greater for the exposures in vivo. This holds good for the slow-growing tumours, the lethal dose being raised from 30 to 80 minutes for the sarcoma and from 25 to 50 minutes for the carcinoma. In the fast-growing tumours the difference is not seen; from this it may be argued that here some extra destructive action is added which is not present when slow-growing tumours are exposed in vivo. In the analysis of these results the comparison of the sarcomas with the carcinomas has been avoided. The differences seen are not sufficiently large to warrant any useful conclusions.

FIG. 3.

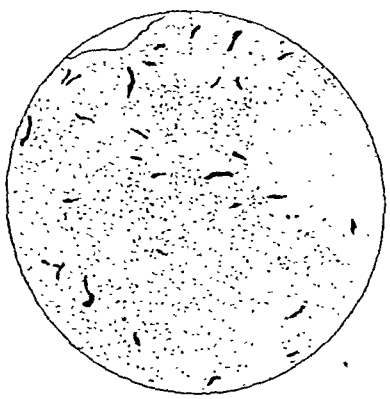
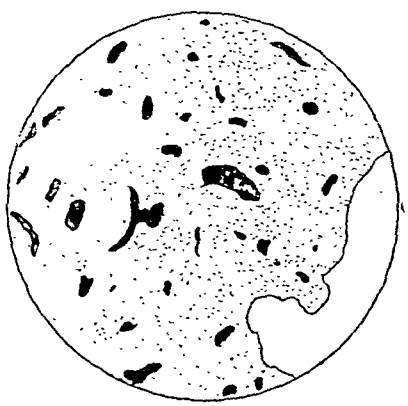


FIG. 4.



The Heightened Susceptibility due to Interference with Blood-supply.

The suggestion is that this extra destructive action, which operates more in the case of fast- than slow-growing tumours, is an interference with blood-supply, on which radiation is known to have a deleterious

TABLE I.—*Exposures in Vitro.*

Min. exp.	Sarcoma.		Carcinoma.		Min. exp.	Sarcoma.		Carcinoma.	
	F.-g.	S.-g.	F.-g.	S.-g.		F.-g.	S.-g.	F.-g.	S.-g.
15	—	5/6	—	8/8	35	7/10	—	0/8	0/4
20	1/4	4/4	10/10	4/6	40	1/17	0/4	0/8	—
25	3/4	10/12	5/12	1/20	45	0/7	—	—	—
30	5/12	1/10	1/8	0/4					

F.-g. = fast-growing. S.-g. = slow-growing.
Min. exp. = minutes exposure.

TABLE II.—*Exposures in Vivo.*

Min. exp.	Sarcoma.		Carcinoma.		Min. exp.	Sarcoma.		Carcinoma.	
	F.-g.	S.-g.	F.-g.	S.-g.		F.-g.	S.-g.	F.-g.	S.-g.
15	—	—	12/12	—	45	3/10	—	—	1/14
20	2/2	—	3/5	—	50	0/5	1/4	—	0/5
25	2/2	—	1/7	—	60	—	3/6	—	—
30	3/4	—	2/8	—	70	—	3/6	—	—
35	5/10	—	0/5	2/2	80	—	3/8	—	—
40	4/15	2/2	—	5/8	90	—	0/5	—	—

The denominator of each fraction indicates the number of animals used and the numerator the number which grew tumours. Only those animals which grew progressive tumours on the control side were included. Thus the effects of immunity were ruled out. With "J.R.S." and "Twort" concomitant immunity is common, so that very large numbers of animals had to be employed to obtain the data.

action. If we knew that the fast-growing tumours were living at the top of their blood-supply this explanation would suffice, and the fact that fast-growing tumours especially tend to undergo necrosis suggests that it is so. Further, the blood-supply of tumours, and especially of fast-growing undifferentiated tumours, is largely sinusoidal and therefore inefficient and likely to be interfered with easily.

Direct evidence is, however, available. The state of the blood-supply of tumours of mice can be seen through the thin skin during life after depilation of the hair. Progressively growing tumours are coloured rosy pink; pressure blanches this colour, which returns quickly when the pressure is released. After radiation a change becomes visible about the third day in tumours which are going to disappear; the colour changes to a deep purple, which is blanched with difficulty, and the return of which is delayed. Evidently the circulation is obstructed. Subsequently the tumour becomes gradually pale and bloodless, changing from purple through orange and yellow to a dirty white colour. During this period the tumour is decreasing in size. Microscopic examination of tumours confirms these observations.[1]

Now as these blood changes always accompany the disappearance of the tumours, it follows that the changes occur after smaller doses of radiation in the fast-growing tumours than in the slow. The question arises: Why do fast-growing tumours suffer a greater obstruction of their blood-supply than do slow-growing ones? Previous work[2 3] has shown that at least two factors are concerned—changes in the blood-vessels themselves and changes in the surrounding cells. Changes in the blood-vessels such as swelling of the endothelial cells must operate alike for both fast- and slow-growing tumours—and it is more likely that some difference outside the blood-vessels is the determining factor. By taking special precautions to preserve the blood content of tumours during removal and preparation the relationship between blood-supply and tumour cells can be well demonstrated. From such material the following drawings were made on squared paper, using a squared graticule in the eye-piece. These diagrams were chosen from a large number of specimens as representative of the average condition. They are here used only to help the description in the text and not as proof of the differences, which can only be obtained by examination of a large number of stained slides.

Comparing T/63 with Twort it is seen that in T/63 all the spaces between the blood-vessels are closely packed with cells, whereas in Twort connective tissue spaces, free of tumour cells, are to be seen. In other words, the masses of tumour cells around the blood-vessels are larger, deeper, and denser in T/63 than they are in Twort. The same holds good when J.R.S. and slow sarcoma are contrasted; the area of cells per blood-vessel is larger in J.R.S.

It is now possible to suggest why the blood-supply of fast-growing tumours, with cells abundantly and closely packed around the blood-vessels, is especially interfered with by radiation. I have shown[3] that the nuclei of cells swell to about three times their normal size (superficial area) on about the second or third day after irradiation. This increase in bulk must take place at the expense of and bring pressure to bear upon surrounding tissues and structures. Thus capillaries and veins will be pressed upon, and in fast-growing tumours where the intervascular spaces are closely packed with tumour cells this will take place to a greater extent than where the tumour cells are less closely packed, as in slow-growing tumours. According to these findings, therefore, the rate of growth is not primarily the determining factor; it is because closely packed cells are commonly found in fast-growing tumours that these are especially susceptible to irradiation.

The radium used in these researches was on loan from the Medical Research Council. I am indebted to Dr. J. A. Murray, of the Imperial Cancer Research Fund, for the supply of the tumours used in these researches.

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ADDISON'S ANÆMIA:

THE EFFECT OF TREATMENT ON THE INTESTINAL INFECTION.

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So many excellent ætiological reviews of Addison's anæmia have recently been published, notably those by Hurst,[1] Davidson,[2] and Davidson, M'Crie, and Gulland,[3] that very little repetition is necessary. For the purpose of this note it may be emphasised that consistently good results are being reported as a result of liver treatment and that all observers are now agreed upon the constant presence of complete achlorhydria and intense gastro-intestinal sepsis, particularly the development, by both descending and ascending infection, of a bacterial flora of fæcal type throughout the whole length of the small intestine. As Davidson remarks, if auto-intoxication does not occur in pernicious anæmia it can never occur at all. Any acceptable ætiological theory of the disease must recognise both these factors, and in recent times much attention has been devoted to their reconciliation. Below are recorded a few bacteriological observations, made before and after treatment, in the hope that they may, of themselves and from comparison with the work of others, prove helpful in clearing up this most difficult problem.

During the past four years I have, whenever opportunity occurred, examined the gastro-duodenal and fæcal bacteriology of proved cases of Addison's anæmia. The results obtained from 37 patients were published[5] in January, 1927, and, after comparing my own results with others available at that time, I suggested that the reason for complete failure on the part of so many workers to isolate a specific bacterium in Addison's anæmia arose from the fact that there is no specific organism, the toxins being products in general of the grossly fæcal flora which comes to occupy the small intestine. In the following year Davidson, after working on similar lines with 32 cases, suggested that it is unnecessary to state categorically whether the toxin is produced by one or all of the organisms present in such abnormal numbers and position, or even whether it is the result of bacterial action on the ingestion of food materials. This observer's detailed bacteriological results have just been published, and, after discussing them with him personally, I think I can safely say that our results agree in all essential particulars, except that I have recorded a somewhat higher incidence of hæmolytic strains of streptococci in the gastro-duodenal specimens, and of *Bacillus coli* in both the gastro-duodenal and fæcal specimens. The former discrepancy is probably explained by the fact that several of the cases in my series suffered from relatively acute oral and upper alimentary sepsis. I found hæmolytic streptococci in the fæces in one case only, but I have concluded from further experiments that the coliform strains do not produce a true, separable hæmolysin, but, as Davidson suggests, cause rapid hæmodigestion in blood media. Therefore my figures for the incidence of hæmolytic strains of *B. coli* were probably too high. I entirely agree with the general finding by many observers that the anaerobic bacteria, many of which are hæmolytic in normal people, are markedly increased in the fæces in Addison's anæmia. A review of all the bacteriological facts so far established shows that in most of the cases the only organisms which can produce a free hæmolysin and are present in sufficient numbers to elaborate in the intestine enough hæmolysin to allow its absorption in any quantity,

are the anaerobic strains, particularly those which would be classified as *B. welchii*. But there are several reasons for hesitation in accepting this organism as the specific cause of the anæmia. For example, it has been my experience as well as that of several other workers on the subject that, as I pointed out when recording my first series of cases, the anaerobic increase does not especially concern the hæmolytic strains. When these fæcal strains of *B. welchii* are isolated such extreme variations are found in the amount of hæmolysin they produce that it is impossible to conclude that an increase in the number of *B. welchii* spores in a fæcal specimen necessarily proves that the amount of free hæmolysin in the intestinal contents is raised in corresponding proportion. Several other reservations are carefully discussed by Davidson[4] in his most recent paper, and need not be detailed here. There is, I think, much to be said for his contention that bacterial hæmolysins are not necessarily of ætiological importance in the disease, and that it is the gastro-intestinal sepsis generally which produces a toxic effect on the liver and prevents it from providing sufficient of that substance which appears to be essential for the proper maturation of the megaloblasts.

Bacterial Content of the Fæces.

The particular concern of the present note is, however, the effect of treatment. Since my original series was published a few more cases have come under observation and, more important, it has been possible to examine some of the original patients after their return to normal. In the first place, the bacterial content of the fæces was estimated before and after successful treatment by high liver diet. Table I.

TABLE I.—*Cases of Addison's Anæmia treated with Liver.*

Case.	Before treatment. Hb. % 40–60.			After treatment. Hb. % 90–100.			Normals.		
	Highest dil. containing—		Ind. v.d.B.	Highest dil. containing—		Ind. v.d.B.	Highest dil. containing—		Ind. v.d.B.
	C.b.	B.w.		C.b.	B.w.		C.b.	B.w.	
1	1 in 10^7	1 in 10^7	+	1 in 10^7	1 in 10^7	−	1 in 10^3	1 in 10	—
2	1 „ 10^6	1 „ 10^6	+	1 „ 10^6	1 „ 10^6	+	1 „ 10^3	1 „ 10^3	—
3	1 „ 10^6	1 „ 10^6	+	1 „ 10^6	1 „ 10^6	−	1 „ 10	1 „ 10^4	—
4	1 „ 10^6	1 „ 10^6	+	1 „ 10^6	1 „ 10^7	+	1 „ 10^3	1 „ 10^3	—
5	1 „ 10^6	1 „ 10^6	+	1 „ 10^6	1 „ 10^6	−	1 „ 10^3	1 „ 10^3	—

Dil. = Dilution. C.b. = Coliform bacilli. B.w. = *Bacillus welchii*. Ind. v.d.B = Indirect van den Berg reaction.

shows typical results from five cases of Addison's anæmia when the hæmoglobin percentage stood at 40–60 per cent. and 90–100 per cent. respectively, and these are compared with the bacterial counts from five normals. The technique employed is essentially similar to that adopted by both Moench, Kahn and Torrey, and Davidson. The experiments were carried only so far as to estimate the number of living *B. welchii* spores and coliform bacilli as a group, not typical *B. coli communis* only; further refinements were considered unnecessary for the present purpose.

Fresh fæcal material was broken up in sterile normal saline in test-tubes of constant size and, after the coarse material had settled, a series of dilutions was prepared with saline, so that each was ten times weaker, until the final dilution represented 1 in 100,000,000 of the original suspension. All the original suspensions were made to match a standard opacity against the same light before the dilution series was commenced. For the detection of the highest dilution containing *B. welchii* spores, previously heated tubes of Robertson's cooked meat medium were used, 1 c.cm. of the various dilutions being added, and, after heating to 80° C. for 20 minutes the tubes were closed with one-inch caps of vaseline and paraffin and incubated at 37° C. for several days. From those tubes which showed the characteristic *B. welchii* reaction subcultures were made into litmus milk tubes similarly capped and incubated in order to obtain the characteristic clot. For the estimation of coliform bacilli plates of bile-salt agar were poured after adding 0·1 c.cm. of each suspension examined.

The figures in Table I. agree in the main with the quantitative estimations of bacteria in the fæces of untreated cases of Addison's anæmia which were made by the observers already quoted, but they also emphasise one very important ætiological point—namely, that the fæcal bacteriology is not altered as the result of liver treatment, and cases showing a return to a normal blood picture still retain their intestinal infection.

The results of the van den Bergh reaction applied to the serum are important in relation to the persistently high bacterial counts. In Cases 2 and 4 the originally positive indirect reaction remained, in spite of the relatively normal blood picture, and in Cases 1, 3, and 5 the reaction had quickly become completely negative after liver treatment was commenced and had remained negative up to the time that the bacterial counts were made. If the positive reaction be taken to represent active hæmolysis, then hæmolysis was still occurring in 2 and 4 but had ceased in the others. If the hæmolysis depends upon the amount of absorbable hæmolysin in the intestines, then one would have expected Cases 1, 3, and 5 to show a decided decrease in the intestinal infection, but this was not seen. The disappearance of the positive van den Bergh reaction does not necessarily appear to correspond with a period of reduced intestinal infection.

One would not, I think, expect liver taken by the mouth to influence directly any intestinal infection present, and that it cannot do so is suggested by the result of an experiment which I have carried out several times with slight modifications. Various liver preparations were incorporated in quantities varying from 0·2 to 2 per cent. in the usual agar and broth media used in routine bacteriological examination of fæces, control cultures being made in the same medium free from liver. No indication could be obtained that liver extract or digested liver had any appreciable influence upon the number of organisms growing in fæcal cultures.

It seems safe to assume, therefore, that liver treatment has no direct influence on the intestinal infection which all observers agree exists in Addison's anæmia. On the other hand it is possible to reduce to some extent the concentration of bacteria in the intestines by systematic attack upon all the factors which give rise to and maintain this infection—e.g., buccopharyngeal and dental sepsis and achlorhydria. In support of this it may be of interest to mention the findings in two cases of Addison's anæmia which came under observation early in 1924, before the introduction of treatment by high liver diet, in whom

TABLE II.—*Addison's Anæmia treated without Liver.*

No.	Before treatment. Hb. 40–60 %.		After treatment. Hb. 80–100 %.	
	Highest dil. containing *B. coli*.	Relative proportion of streptococcus to coliform.	Highest dil. containing *B. coli*.	Relative proportion of streptococcus to coliform.
1	1 in 10^4	1 to 20	1 in 10^3	1 to 75
2	1 „ 10^3	1 „ 15	1 „ 10^2	1 „ 65

systematic eradication of septic foci, administration of dilute hydrochloric acid by the mouth, and a long course of *B. acidophilus* milk produced gradual recovery to a normal blood picture, which has been maintained. At that time only quantitative examinations of the total number of coliform bacilli in the fæces and the relative number of streptococci to coliform organisms on plates were made. In both cases the bacterial counts were noted to fall quite definitely. It is unfortunate that anaerobic counts were not also made. The evidence of only two cases is, of course,

action. If we knew that the fast-growing tumours were living at the top of their blood-supply this explanation would suffice, and the fact that fast-growing tumours especially tend to undergo necrosis suggests that it is so. Further, the blood-supply of tumours, and especially of fast-growing undifferentiated tumours, is largely sinusoidal and therefore inefficient and likely to be interfered with easily.

Direct evidence is, however, available. The state of the blood-supply of tumours of mice can be seen through the thin skin during life after depilation of the hair. Progressively growing tumours are coloured rosy pink; pressure blanches this colour, which returns quickly when the pressure is released. After radiation a change becomes visible about the third day in tumours which are going to disappear; the colour changes to a deep purple, which is blanched with difficulty, and the return of which is delayed. Evidently the circulation is obstructed. Subsequently the tumour becomes gradually pale and bloodless, changing from purple through orange and yellow to a dirty white colour. During this period the tumour is decreasing in size. Microscopic examination of tumours confirms these observations.[1]

Now as these blood changes always accompany the disappearance of the tumours, it follows that the changes occur after smaller doses of radiation in the fast-growing tumours than in the slow. The question arises: Why do fast-growing tumours suffer a greater obstruction of their blood-supply than do slow-growing ones? Previous work[2 3] has shown that at least two factors are concerned—changes in the blood-vessels themselves and changes in the surrounding cells. Changes in the blood-vessels such as swelling of the endothelial cells must operate alike for both fast- and slow-growing tumours—and it is more likely that some difference outside the blood-vessels is the determining factor. By taking special precautions to preserve the blood content of tumours during removal and preparation the relationship between blood-supply and tumour cells can be well demonstrated. From such material the following drawings were made on squared paper, using a squared graticule in the eyepiece. These diagrams were chosen from a large number of specimens as representative of the average condition. They are here used only to help the description in the text and not as proof of the differences, which can only be obtained by examination of a large number of stained slides.

Comparing T/63 with Twort it is seen that in T/63 all the spaces between the blood-vessels are closely packed with cells, whereas in Twort connective tissue spaces, free of tumour cells, are to be seen. In other words, the masses of tumour cells around the blood-vessels are larger, deeper, and denser in T/63 than they are in Twort. The same holds good when J.R.S. and slow sarcoma are contrasted; the area of cells per blood-vessel is larger in J.R.S.

It is now possible to suggest why the blood-supply of fast-growing tumours, with cells abundantly and closely packed around the blood-vessels, is especially interfered with by radiation. I have shown[3] that the nuclei of cells swell to about three times their normal size (superficial area) on about the second or third day after irradiation. This increase in bulk must take place at the expense of and bring pressure to bear upon surrounding tissues and structures. Thus capillaries and veins will be pressed upon, and in fast-growing tumours where the intervascular spaces are closely packed with tumour cells this will take place to a greater extent than where the tumour cells are less closely packed, as in slow-growing tumours. According to these findings, therefore, the rate of growth is not primarily the determining factor; it is because closely packed cells are commonly found in fast-growing tumours that these are especially susceptible to irradiation.

The radium used in these researches was on loan from the Medical Research Council. I am indebted to Dr. J. A. Murray, of the Imperial Cancer Research Fund, for the supply of the tumours used in these researches.

References.—1. Mottram, J. C.: Brit. Med. Jour., 1927, i., 275. 2. Ibid., Jour. Roy. Micros. Soc., 1926, xlvi., 123. 3. Ibid., Brit. Jour. Rad., 1927, xxxii., 61.

ADDISON'S ANÆMIA:

THE EFFECT OF TREATMENT ON THE INTESTINAL INFECTION.

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systematic eradication of septic foci, administration of dilute hydrochloric acid by the mouth, and a long course of *B. acidophilus* milk produced gradual recovery to a normal blood picture, which has been maintained. At that time only quantitative examinations of the total number of coliform bacilli in the fæces and the relative number of streptococci to coliform organisms on plates were made. In both cases the bacterial counts were noted to fall quite definitely. It is unfortunate that anaerobic counts were not also made. The evidence of only two cases is, of course,

inconclusive, particularly in such a disease as Addison's anæmia. Whatever reduction in intestinal infection occurred, however, was evidently due to direct attack on the septic factor in the disease.

That this septic factor may be present without producing actual anæmia is clear from the figures in Table III., which records the fæcal bacteriology in three other cases of complete achlorhydria.

TABLE III.—*Cases of Complete Achlorhydria without Anæmia.*

No.	Highest dil. containing coliform bacilli.	Highest dil. containing *B. welchii*.	V. d. Bergh reaction.
1	1 in 10^6	1 in 10^7	—
2	1 „ 10^6	1 „ 10^8	—
3	1 „ 10^6	1 „ 10^6	—

In each of these cases the gastric germicidal barrier was entirely absent, as is seen from the high counts of the organisms in the fæces, but the blood picture was quite normal. In short, the intensity of the intestinal toxæmia must evidently exceed a certain level before anæmia begins to develop, which is a good reason for attempting, in those cases which are anæmic, to reduce the intestinal infection by direct means, in spite of the fact that they may, as far as the blood picture is concerned, show a good response to liver treatment.

The cases in Table I. have retained their high bacterial counts in the fæces throughout an apparently successful course of liver diet. In the past it was common to produce prolonged remissions of the anæmia simply by reducing the intestinal infection and improving the patient's general condition. It is, then, but a short step to the suggestion that Addison's anæmia may be influenced in two entirely different ways, because there are two distinct factors concerned. The bacteriological facts seem to be entirely in accord with the theory that liver treatment promotes regeneration of normal blood cells from the flagging bone-marrow, and presumably augments the supply of some marrow-activating liver-derived substance normally present in the circulation. If sufficient regenerative response is obtained the influence of the intestinal toxæmia may be entirely overshadowed. On the other hand, in a certain number of cases where the bone-marrow is not too exhausted to recover of itself, a small reduction in the intestinal toxæmia may just sway the balance sufficiently to allow the regenerative phase to be established. In short, in Addison's anæmia we may have a relatively delicate balance between the natural reproductive powers of the bone-marrow (which are in turn dependent upon an adequate supply of liver substance) and a toxæmia. It is possible to produce a normal blood picture in nearly all cases by stimulating the former by liver treatment, and in a smaller number, perhaps those of shorter history, by reducing the intestinal infection sufficiently to allow the bone-marrow to recover.

Recent clinical reports all agree that the nervous lesions in patients showing signs of subacute combined degeneration of the cord appear to be uninfluenced by liver treatment. That the bacterial content of their fæces is high, whether they are anæmic or not, can readily be demonstrated. For example, Case 5 in Table I. and Case 1 in Table III. are brothers, both with complete achlorhydria. The first showed a hæmoglobin percentage of 30 with a typical blood picture of Addison's anæmia; the second had definite signs of subacute combined degeneration of the cord, but his blood picture was absolutely normal. Liver treatment was entirely successful in the former, his hæmoglobin rising steadily to 90 per cent., but was without effect upon the nervous symptoms of the latter who, however, showed signs of improvement under systematic direct attack upon his alimentary sepsis. From cases of subacute combined degeneration of the cord under his care, Dr. Hurst has been kind enough to show me several instances in which progress of the cord lesions has been arrested in this way and others in which undeniable improvement has occurred. Evidently it is possible, by reducing the intestinal bacteria, to influence favourably the cord lesions as well as to relieve to some extent the exhaustion of the bone-marrow, but liver treatment is effective for the latter purpose only. Therefore in all cases showing signs of cord involvement it is especially important to attack the septic element directly, as well as instituting liver treatment if anæmia is present.

Conclusions.

Evidence is given that liver treatment does not influence the intensity or the nature of the intestinal infection in Addison's anæmia, that the disappearance of the positive indirect van den Bergh reaction does not necessarily correspond with a reduction in the intestinal infection, and that cases in which return to a normal blood picture has occurred may still show just as high a bacterial content in the fæces as when in the acutely anæmic stage.

To prevent remissions, therefore, the necessity of treating the alimentary sepsis directly as well as administering liver is emphasised, and some bearings of the bacteriological facts upon the possible ætiology of the disease are briefly discussed.

References.—1. A. F. Hurst: Brit. Med. Jour., 1927, ii., 676. 2. L. S. P. Davidson: Edin. Med. Jour., 1928, xxxv., 322. 3. L. S. P. Davidson, J. G. M'Crie, and G. L. Gulland: THE LANCET, 1928, i., 847. 4. L. S. P. Davidson: Jour. Path. and Bact., 1928, xxxi., 557. 5. F. A. Knott: Guy's Hosp. Rep., 1927, lxxvii., 5.

Clinical and Laboratory Notes.

THE ADRENALIN TEST FOR THYROTOXICOSIS

BY LAMBERT ROGERS, F.R.C.S. EDIN.,
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GROSS deviations of thyroid function in the direction, on the one hand, of hyperactivity with the possibility of perversion, and on the other of insufficiency have long been recognised. Both cretinism and exophthalmic goitre were noticed before 1840; myxœdema was described by Sir William Gull, of Guy's, in 1873, and shortly afterwards named by Ord, of St. Thomas's, and cachexia strumipriva was defined by Kocher in 1882. Lesser degrees of thyroid perversion, however, were not recognised until recently, and even now are frequently overlooked. The well-known signs are increased basal metabolism; tachycardia; thyroid enlargement; vasomotor disturbances, pallor alternating with periods of flushing and free perspiration, feeling of heat, mental acuity, perhaps irritability or delirium; tremulousness, especially in the outstretched hands; diarrhœa; glycosuria and lowered sugar tolerance; low blood pressure; vomiting; sleeplessness; loss of weight; pigmentation, and exophthalmos, all of which are only present in cases of very toxic exophthalmic goitre. In less toxic cases, and especially in other varieties of thyrotoxicosis, these may be present in part only or may be only evoked by arduous exertion, some intercurrent disease, or an emotional shock. The basal metabolic index may serve to distinguish incipient cases of thyrotoxicosis, but basal metabolism estimations have certain disadvantages, the chief of which is the wide limits of error in making the estimation, the result being appreciably affected by the nervousness of the patient. Other disadvantages are discomfort to the patient, whose exogenous metabolism must be reduced to a minimum by starvation, and the expense of the necessary apparatus. To avoid these difficulties search was made for a clinical test which would be simple, safe, and easy to perform, and since the sympathetic nervous system in thyrotoxic patients is hypersensitive to adrenalin

TABLE I.—ADRENALIN REACTIONS IN GOITRE CASES.

No.	Sex.	Age.	Type of goitre.	Pulse-rates. Mean before adrenalin.	Pulse-rates. Mean after adrenalin.	Pulse-rates. Increase or decrease.	Blood pressure mm. Hg. Mean before.	Blood pressure mm. Hg. Mean after.	Blood pressure mm. Hg. Increase or decrease.	Result.	Remarks.
1	F.	53	Exophthalmic.	131	170	+39	137·5	163	+25·5	Positive.	Tremors appeared, epigastric pulsation and transient auricular fibrillation.
2	M.	49	Cyst in left lobe. Mild hypothyroidism.	93	84	−9	120	106	−14	Negative	—
3	F.	19	Endemic goitre. Scabbard trachea. Mild thyrotoxicosis.	79·3	112	+33·3	111	126	+15	Positive.	Felt her heart beating.
4	F.	48	Suppurative thyroiditis. Thyrotoxicosis.	132	160	+28	138	139·6	+ 1·6	Positive atypical.	Tremors developed. Extrasystoles noted.
5	F.	33	Multiple adenomata. Mild thyrotoxicosis.	81	111	+30	133	132	− 1	Positive atypical.	Tremors elicited.
6	F.	29	Graves's disease.	120	160	+40	117	148	+31	Positive.	Felt hot. Tremors became coarser.
7	F.	26	Adeno-parenchymatous.	86	111	+25	128·5	131·5	+ 3	Positive atypical.	—
8	F.	43	Adeno-parenchymatous. Toxic.	103	121	+18	123	128	+ 5	Positive atypical.	Felt heart palpitating. Tremors elicited.
9	F.	44	Multiple adenomata. Toxic.	91	114	+23	168	189	+21	Positive.	Pulsation of carotids became visible.
10	F.	17	Multiple fœtal adenomata.	80	90	+10	93·5	95·6	+ 2·1	Negative	—
11	F.	44	Adeno-parenchymatous. Mildly toxic.	100	105	+ 5	127·5	136·5	+ 9	Positive.	Fine tremors appeared in outstretched hands.
12	F.	63	Adeno-parenchymatous. Toxic.	100	130·5	+30·5	144·5	165	+20·5	Positive.	Tremors appeared. Perspiring freely. Pulsation of jugulars noted.
13	F.	28	Fœtal adenoma (right lobe). Breaking down in centre.	71·2	84·4	+13·2	97·4	109·9	+12·5	Positive.	—
14	F.	47	Multiple adenomata.	76·8	82	+ 5·2	114·4	120	+ 5·6	Positive.	—
15	F.	58	Multiple adenomata. Old standing (?). Early malignant change.	82·4	75·6	− 6·8	123·4	119·8	− 3·6	Negative	—
16	F.	20	Exophthalmic.	121·6	149	+27·4	113·6	160·4	+46·8	Positive.	Tremors became coarser; felt heart palpitating; became anxious.
17	M.	25	Exophthalmic.	101	106·8	+ 5·8	132	141·8	+ 9·8	Positive atypical.	—*
18	F.	18	[illegible]	91	94	+ 3	116·5	116·6	+ 0·1	—	No tremors. No subjective symptoms.
19	F.	26	[illegible]	87	87	..	121	113	− 8	—	Coarse tremor in left hand. No subjective symptoms.
20	F.	19	Adeno-parenchymatous.	95	104	+ 9	123	120	− 3	—	—

* Ten minutes after injection præcordial and carotid pulsation present, and tremor in right hand somewhat exaggerated. Very marked exophthalmos, but cardiovascular features in abeyance. While under observation, pulse was not above 110 at any time.

the adrenalin reaction introduced by Emil Goetsch was tried and in a slightly modified form was found to be very effective.

The Adrenalin Test.

In 1916 Levy [1] showed that in cats an injection of adrenalin raised the systolic blood pressure very considerably if the cervical sympathetic were stimulated at the same time, whereas when this nerve was not stimulated the rise was not nearly so great. The rise did not occur if the thyroid had been previously extirpated, and it was concluded therefore that the secretion of this gland sensitised the sympathetic to the effect of adrenalin. In man many of the signs and symptoms of thyrotoxicosis can be exaggerated in a frank case or rendered apparent in an incipient one by adrenalin injections.

Goetsch,[2] of Long Island College Hospital, Brooklyn, applied these facts clinically, and in 1918 described an adrenalin test, the result of which is regarded as positive if, after subcutaneously injecting 0·5 c.cm. of fresh 1 in 1000 solution of adrenalin hydrochloride, a rise in the pulse-rate of 20 or more beats and in the systolic blood pressure of from 10 to 50 mm. of mercury occurs within five minutes of the injection. Various degrees of positivity occur.

The Adrenalin Test of Goetsch, Slightly Modified.—The test has been performed in a slightly modified form from that originally introduced by Goetsch, and is carried out as follows:—

TABLE II.—*Adrenalin Reactions in Healthy Subjects.*

No.	Sex.	Age.	Pulse-rates. Mean before adrenalin.	Pulse-rates. Mean after adrenalin.	Pulse-rates. Increase or decrease.	Blood pressure (mm. mercury). Mean before.	Blood pressure (mm. mercury). Mean after.	Blood pressure (mm. mercury). Increase or decrease.	Result.
1	M.	52	88	80	− 8	131·6	125	− 6·6	Neg.
2	M.	20	75	69	− 6	112·5	108	− 4·5	"
3	M.	23	72·6	75	+ 2·4	130	127·5	− 2·5	"
4	M.	19	65·3	85	+19·7	122·6	133·5	+10·9	Sl. pos.*
5	M.	21	81	89	+ 8	128·5	131	+ 2·5	Neg.
6	M.	21	77	83	+ 6	130·5	126·5	− 4	"
7	F.	23	93	94	+ 1	109	108	− 1	"
8	F.	23	97	95	− 2	116	110·5	− 5·5	"
9	F.	24	89	88	− 1	117	111·5	− 5·5	"
10	F.	20	93·5	100	+ 6·5	120	122	+ 2	"

* Sl. pos.=slightly positive.

There was clinical evidence of slight thyroidism. Subjects 5, 7, 9, and 10 felt heart beating about five minutes after the injection, and 7 developed a slight tremor.

The patient, who is resting quietly in bed, has the test explained to her and is assured that there will be neither danger nor pain. The pulse-rate and systolic blood pressure are taken at short intervals until constant, and a mean is obtained. 0·5 c.cm. of a 1 in 1000 solution in normal saline of fresh adrenalin hydrochloride is then injected subcutaneously over the deltoid, and a further series of readings are taken up till 15 minutes later; at the

[1] Levy, R. L.: Amer. Jour. Physiol., 1916, xli., 492.

[2] Goetsch, Emil: Newer Methods in the Diagnosis of Thyroid Disorders, Pathological and Clinical. Clifton Med. Bull., 1918; [illegible], 1920, iv., 589; New York State Med. Jour., 1918, xviii., 259.

same time signs and symptoms are noted, since these may be evoked or exaggerated.

Tables I. and II. show the result of this test applied to a series of goitre cases and to a series of healthy students who volunteered for the purpose. It will be seen that in healthy subjects there is little or no response.

Objections to the adrenalin test have been raised, but most observers agree that when it is negative the patient is in all probability not suffering from thyrotoxicosis. In our experience a markedly positive result indicates definite thyrotoxicosis. The atypical results are more difficult of interpretation, but it has been found that where the reaction to the adrenalin test is severe, the reaction to operation on the thyroid is also severe. Hence the extent of the reaction to adrenalin gives an indication of the degree of post-operative thyroidism to be expected.

The value of the adrenalin test carried out according to the technique described may be summarised as follows: 1. It reveals the presence of incipient thyroidism. 2. It provides a rough estimation of (*a*) the degree of thyroid intoxication, and (*b*) the extent of the reaction which is liable to follow operation on the thyroid. 3. If the reaction is absent or negative, the goitre is not toxic, and there will be no post-operative reaction.

A NOTE ON ATYPICAL OR MILD ENTERIC.

By EUSTACE THORP, O.B.E., M.B. BELF., D.P.H.,
DEPUTY MEDICAL OFFICER OF HEALTH FOR SUNDERLAND.

SOME months ago I reported [1] some curious cases that appeared to be of enteric nature, observed over about a year amongst so-called pneumonias and in small groups. One or two in each group gave a positive Widal to typhoid or paratyphoid B; the remainder were negative though clinically mild enterics, and their chief characteristic was a febrile attack of from 10 to 17 days' duration. On the return of the temperature to normal rose spots made their appearance and clinically the cases were diagnosed as enteric or paratyphoid B as the case might be. By the time the spots appeared the patient as a rule seemed to be convalescent. Blood tests were taken and in about one case in five came back positive in dilution of 1/50 and 1/125, the remainder being negative. The blood of other patients whose condition had been confidently diagnosed as enteric was examined with much the same results. I then tried repeated Widal reactions and had the satisfaction of finding that, like the rash, the reaction appeared to be delayed, positive results being obtained as late as the thirty-ninth day when the patient was quite well and would in the ordinary way have been discharged from hospital had we relied upon the Widal test to exclude enteric.

These cases were sent in as "pneumonia" or "observation pyrexia," and inquiry would frequently demonstrate a previous case of pneumonia with which the patient had been in contact. Usually there were few signs in the lungs, but the pyrexia had remained present rather long. It subsided shortly after admission and the patients were able to get up. Then it was found that they showed typical lenticular rose-pink spots which led to investigation of the blood. Much has been said lately about the laboratory being a bad master, and I think the above cases show that clinical evidence of enteric is essential and that a negative Widal does not exclude the disease, particularly in the mild forms.

Cases in my series have alternated, suggesting a vacillation in the presence of the reaction. To-day, I am afraid, the clinical diagnosis of enteric is often washed out on a single negative Widal. I suggest that it is cases such as the above that keep enteric going as much as the suspected but often untraceable "carrier," and if so the mystery of the sporadic case may not always be so elusive. The Widal seems to have but a small margin of error in well-marked clinical cases, but mine show that the margin of error in very mild cases is much greater and that laboratory confirmation involves several tests.

I publish these notes principally to correct a fallacy perpetuated in text-books that there is little error in Widal reactions. To-day this applies, I feel sure, only to the well-marked clinical case. In the mild forms of the disease the reaction is often delayed, and many cases like those I have described do undoubtedly exist. I have always suspected that these mild infections could be found among the "pneumonia" notifications at periods when sporadic cases were appearing and that they are missed both inside and outside hospital. On watching them the spots were found to appear during apparent convalescence; the Widal test was negative and the patients were discharged. Later they were detained and further Widal tests proved positive. All the cases were easily diagnosed clinically as enteric or paratyphoid before the first Widal test was made.

[1] THE LANCET, 1928, i., 371.

NOTE ON THE TREATMENT OF ASTHMA IN CHILDREN WITH TUBERCULIN.

By T. M. LING, B.M. OXF.,
JOHN AND TEMPLE RESEARCH FELLOW IN DISEASES OF CHILDREN, ST. THOMAS'S HOSPITAL.

WITHIN the last few years considerable interest has been reawakened in the treatment of asthma with small doses of tuberculin, the credit for this being due primarily to W. S. van Leeuwen, of Leiden.

In 1897 Bussenius [1] obtained encouraging results with tuberculin treatment in a patient suffering from asthma and pulmonary tuberculosis, and in 1913 Frankfurter [2] published seven cases of asthma treated in a similar way, all of whom did well. Since then Bouveyron,[3] Bonnamour and Duquaire [4] in France, and Nelson [5] in England have shown promising results. Van Leeuwen,[6] working with a large series, claims that about 50 per cent. are almost completely cured, about 25 per cent. are improved, and 25 per cent. are uninfluenced. Most of the patients so treated have been adults and therefore it was considered to be of interest to try the effect of this treatment on children. Twenty-four asthmatic cases were therefore chosen from the children's out-patient department at St. Thomas's Hospital, all of whom had been receiving treatment for not less than two years, while many of them had had symptoms for a considerably longer time. The treatment that had been given previously was potassium iodide by the mouth and injections of adrenalin during the attacks, while any source of infection in the mouth or naso-pharynx had been eradicated.

As a preliminary measure all the cases were examined clinically and radiologically to exclude as far as possible pulmonary fibrosis and enlarged mediastinal glands. Some of the French literature recently has suggested an association between congenital syphilis and asthma and consequently all the cases were examined with this point in view; no suggestive clinical signs were found and the Wassermann reaction was negative in every case. The average age of the patients was 7·5 years.

Cutaneous Pirquet reactions were done in all cases and 45 per cent. gave definitely positive reactions. Quite recently Baagoë [7] published the results of the test on a much larger series of asthmatic children, and found that only 32 per cent. gave positive reactions. The treatment appeared equally efficacious, whether the cutaneous reaction was positive or negative.

Method of Treatment.

In all cases Old Tuberculin (Burroughs Wellcome and Co.) was used and injections were given subcutaneously once a week. As the children were out-patients, it was not feasible to see each case on the day following the injection, but the mothers were instructed to note any general or local reaction that occurred; 385 injections were given and a general reaction was noted in two cases, while a history of a definite local reaction was given in five cases.

The usual procedure was to start injections with 0·1 c.cm. of a dilution of 1 in 1,000,000 and increase the dose on each occasion by 0·1 c.cm. or 0·2 c.cm. until 0·1 c.cm. of a 1 in 100,000 dilution was reached. Beyond this the dose was increased very gradually until the optimum quantity was found for each individual case. When once the correct quantity is obtained, it is not advisable to increase the strength of the injection as an attack of asthma is liable to be brought on. On two occasions this occurred within an hour of the injection, where the strength had been increased unduly quickly.

Two separate courses of treatment have been given with an interval of two months. Naturally the individual attendances were sometimes irregular, but for the whole group it was excellent, and the willingness and enthusiasm with which the mothers brought up the children week after week is probably the best indication of the efficacy of the treatment, particularly as each injection necessitates a certain amount of pain for the child. The average number of injections in the first course was 15 and in the second 10; thus it can be seen that the treatment takes a considerable time.

Results.

Of the original 24 cases, three were unaffected by the treatment and were discharged, while two discontinued treatment as they left the district. The remaining 19 had regular treatment, with occasional weekly lapses owing to intercurrent illness, and are all improved. The word "cure" admittedly should be used with greater caution than usual in asthma and only two cases could be included under this heading. The remaining 15 cases remained practically free from symptoms while under treatment, but lapsed to a varying degree between the courses and since treatment was discontinued. In asthma the patient's symptoms are the only index of the severity of an attack, and in every one of these cases the mother was emphatic that the attacks were much less severe and less prolonged than previous to treatment. A careful record was made in each case of the average interval of freedom from attacks previous to treatment and subsequent to the latter this interval has been increased by approximately 30 per cent.

Conclusions.

Admittedly the results are not striking and do not harmonise with van Leeuwen's claims that 50 per cent. of cases are curable by this means. On the other hand, it is justifiable to state that the frequency and the intensity of the asthmatic attacks can be diminished and this in itself is a justification for a more extended trial and for the inclusion of tuberculin among the methods of treatment of the established disease.

I am indebted to Dr. R. C. Jewesbury for permission to publish these cases.

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JOINT TUBERCULOSIS COUNCIL.—At a meeting of the Council, held on Oct. 17th, Dr. H. G. Sutherland reported on the recent International Tuberculosis Conference at Rome. Some of the posters exhibited there were, he thought, too terrifying to achieve useful purpose. Dr. G. Lissant Cox presented a statistical study on The Fate of Young Children in Tuberculous Households, dealing with a total of 1623 children up to 5 years, the figures being controlled by standard modern statistical methods. This study revealed that the number of deaths from non-pulmonary tuberculosis in young children exposed to infection from pulmonary cases was some ten times as great as that of the controls.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF OTOLOGY.

Mr. SOMERVILLE HASTINGS took the chair at a meeting of this Section on Nov. 2nd, and delivered a Presidential address on the

Estimation of Hearing Capacity.

Reviewing the progress of otology during the last 25 or 30 years he could not help feeling, he said, that our comparative ignorance of the pathology and treatment of so many cases of deafness of both the middle and internal ear types was partly due to the methods of examination used in the past. The hearing capacity, judged by the distance at which a whisper, the conversational voice, a watch, or Politzer's acoumeter could be heard, though of value clinically, were quite useless for scientific purposes. It was necessary at least to have a relatively pure sound such as that produced by a tuning-fork or a wireless valve; in the audiometer shown to the Section by W. S. Tucker and himself in 1923 the source of sound was a wireless valve, but the estimation of hearing was by means of purely arbitrary units. Harvey Fletcher estimated hearing capacity in what he called sensation units, such a unit being the minimal change in the intensity of a sound perceptible to the normal ear, but this did not go very far. What the speaker wanted to know before he could form a correct mental picture of a given case of deafness was, for every pure note between the upper and lower limits of audition, the percentage of normal hearing that remained. If it was also possible to estimate in percentages the degree to which the cochlear nerves and cerebral centres were functioning, the observer could say exactly to what extent the deafness was due to changes in the conducting apparatus and to what extent in the perceptive. Supposing, for example, it was found that a patient had 25 per cent. normal hearing when tested by air conduction, and say 50 per cent. normal hearing when his perceptive function was tested, then it could be said that he had only $\frac{25}{50}=50$ per cent. of normal hearing by conduction, or, in other words, that owing to impairment of the conduction of sound waves only 50 per cent. of the waves passing through the external and middle ear of a normal individual and reaching the cochlea were able to pass through his.

The President was convinced that for scientific study of deafness it was essential to give up arbitrary units of hearing and try to discover what percentage of the normal power of conduction and what percentage of the normal power of perception were present for pure sounds of the principal wave-lengths. That was the problem to be solved, and it was not an easy one.

He proposed to consider first the principles involved in estimating the perceptive function. It must be evident that the ordinary method of estimating bone conduction by means of a vibrating tuning-fork placed upon the mastoid was open to a thousand fallacies, since the more complete the interference with conduction through changes in the external or middle ear the longer would the sound of the tuning-fork be heard. In November, 1917, a committee of the Section formed to organise otological research had issued a report whose most useful recommendations, he thought, were those concerning hearing tests. Coming at a time of great national stress, the report had not received the attention it deserved. One of the tests therein recommended was that described as "absolute bone conduction." To carry out this test the observer (who presumably had normal hearing) and the patient each blocked his external auditory meatus with his finger, preferably by pressure on the tragus. A vibrating tuning-fork was then alternately pressed on to the mastoids of the patient and observer until it was no longer heard, and in this way the bone

conduction of the two persons was compared. Ever since the publication of the report the speaker had made use of this test in every case of deafness that he had at all carefully investigated, but so far he had never found absolute bone conduction increased above the normal. The oft-repeated statement that in otosclerosis bone conduction was increased was therefore untrue if it was applied to absolute bone conduction. If the comparison between the bone conduction of the patient and observer, with the meatus unblocked, was referred to, then admittedly in so-called otosclerosis bone conduction was increased. But so it was in all other forms of conductive deafness, whatever injury or disease of the external or middle ears was their cause. Indeed the increase of bone conduction as thus tested in the most advanced case of otosclerosis conceivable could not be greater than it was when a normal ear was thoroughly obstructed by a plug of wax.

Obstruction of the meatus in the absolute bone conduction test increased the perception by bone conduction very considerably. Therefore, if the degree of perceptive hearing (bone conduction) in the two ears was approximately equal, however great the degree of conductive deafness in the ear not being examined, the test would not be vitiated by it. Difficulties would only arise where there was marked perceptive deafness on the side being tested, with good cochlea hearing and considerable conductive deafness on the other side—an unusual combination. In such cases the patient would usually say at once that he was hearing the tuning-fork in the opposite ear, and it would be easy to exclude the ear not being tested, either by means of a noise machine (Bárány's box), or by rapid movement of the finger in the meatus. Lowndes Yates, T. A. Clarke, and others had shown that the total hearing (perceptive and conductive) power of a patient for C2 and other tones could be estimated as follows:—

A tuning-fork is held at any constant distance from the patient's ear. When he ceases to hear it it is transferred to a similar distance from the ear of an observer who has normal hearing, and the time noted until it becomes inaudible. This gives the deficiency in seconds of the patient for the note in question. By means of a table or graph this can be converted into percentage retention of "normal hearing distance," and seeing that the intensity of sound varies inversely as the square of the distance from its source, the square root of this figure gives the percentage of total hearing power present.

By means of the absolute bone conduction (A.B.C.) test it was possible to estimate the percentage of normal perceptive (cochlea) hearing retained by a patient. A vibrating tuning-fork was held on the patient's mastoid with the meatus closed until perception of sound ceased. It was then transferred to a normal ear and the time noted until the perception of sound by air conduction ceased. By means of the table referred to above this was translated into percentage retention of normal hearing distance (N.H.D.). If not already known, a similar observation was made with regard to the absolute bone conduction of a person with normal hearing; then the formula—

$$\frac{\text{Percentage retention of N.H.D. for patient's A.B.C.}}{\text{Percentage retention of N.H.D. for normal A.B.C.}} \times 100$$

gave the percentage of perceptive hearing present. Knowing, then, the percentage of total hearing present in a given case and also the percentage of perceptive (cochlea) hearing it was easy to determine to what extent, if any, the deafness was due to changes in the conduction (external and middle ear) apparatus.

It might be objected, said the President in conclusion, that such methods as these were laborious and crude, and moreover uncertain because the personal equation of two individuals was involved. He knew of no other method, however, that would tell him what he wanted to know. He was also sure that neither investigations regarding otosclerosis nor any other similar researches would really prosper until methods of testing ears and estimating hearing capacity had been standardised. The last attempt made by the Section of Otology had been by a committee set up in 1917 at a period when few were able to give much time or attention to the subject. Was it not time that the Section made another attempt to solve this important problem?

Dr. KERR LOVE (Glasgow) read a paper entitled

A Classification of Deafness Based on the Effect of Deafness on Efficiency.

He said he approached the subject from the standpoint of the capacity of the deaf person. He invited a comparison between the child of 5 years with normal hearing and one of the same age who was born deaf. The former was full of life and chatter, with a small but increasing vocabulary, whereas one felt helpless in attempts to amuse the deaf child. It took ten years of special education to equip the deaf child for any walk in life, and at the end of that time his choice of an occupation was restricted. Dr. Love submitted four subdivisions: (*a*) Cases in which the deafness was congenital, including a small proportion in which the cause was congenital syphilis. Mostly these cases had some island of hearing in their deafness. (*b*) Mute, or semi-mute. In the matter of capacity these did not differ materially from the first class. They might have to go into special schools for the deaf. Usually the deafness was total, and may have been due to cerebro-spinal fever or to syphilis. (*c*) Those who had become deaf after the speech habit had been well established. Generally here, too, the deafness was total, but owing to speech having been acquired in childhood the outlook in regard to usefulness and enjoyment was superior to that of the child born deaf. The basis of the teaching was the substitution of one sense for another. (*d*) The partially deaf, the largest and the most hopeful class, and one which came within the scope of hearing tests. If a person could hear the whispered voice at the distance of 20 ft. he was not likely to rest under any employment disability or handicap; but if a child could not hear whispered speech at 6 ft. he could not profitably remain in the ordinary class of an elementary school.

Dr. Love advocated four practical measures. The first was an intensive campaign against aural disease in children. The second was an intensive study of otosclerosis with the view to prevention. Thirdly, he favoured compulsory notification of cases of congenital syphilis; and lastly he would have the public educated about the causation of congenital deafness. Congenitally deaf people should not be allowed to marry into families having a like disability.

Dr. T. A. CLARKE (Canterbury) read a paper on

Hearing Tests.

He passed over the subject of the testing of the upper and lower limits, especially as the present methods of testing for these were fairly satisfactory. In performing Gellé's test one noted, he said, any change in the perception of bone-transmitted sound occurring during the alteration of air pressure in the meatus. Gellé supposed that increased pressure in the meatus caused inward movement of the drumhead, ossicles, and the footplate of the stapes, so causing a rise in the intralabyrinthine pressure, with consequent lessened sensitivity of the cochlea; that fixation of the stapes would prevent such a sequence and there would be no variation of perception. This view, Dr. Clarke considered, was untenable, though the actual significance of the Gellé test was not yet known. With regard to tests dependent upon perception of tuning-forks by air and bone conduction, these were the Rinne, the Schwabach, the Weber, and the Bing tests. Only the last of these needed explanation. In carrying it out the base of the tuning-fork was placed on the mastoid. When perception ceased the mastoid was occluded. If the fork then became audible Bing was said to be positive. These tests were important in making a functional diagnosis, and he considered it was their shortcomings which were responsible for the present unsatisfactory state of aural diagnosis. The fundamental reason for their

failure was that the result was influenced by changes in both conductive and perceptive functions, and therefore the result could be indicative of neither.

Physiologically, hearing power was the sum of the conductive and perceptive functions. The primary determination of the conductive function was difficult, either by subjective or objective methods, though Bing's test might provide an approximate indication. But the perceptive component could be accurately assessed by a comparison of the patient's absolute bone conduction. The test consisted, as the President had said, of the perception of a tuning-fork placed on the mastoid, the meatus being closed by the finger, and compared with the normal person's absolute bone conduction. In doing the test the tuning-fork should be raised and lowered, rather than kept in constant application, as fatigue might render the result unreliable. As soon as the patient ceased to hear the fork it was transferred to the tester's own mastoid and the meatus was closed. If the patient had no perceptive disorder there was no after-perception by the normal ear.

Dealing next with quantitative tests, Dr. Clarke said that one might express the hearing defect in arbitrary units, what the Americans termed "sensation units," or in intensity units, or on a hearing-distance basis. The last of these, in the speaker's view, was the best. It had been the custom to consider hearing, deafness, and the loudness of sounds in terms of distance. In practice the voice was an impossible agent in this connexion. Both the watch and the acoumeter were useful for testing hearing capacity in the matter of noises of high pitch. Electrical audiometers were valuable for research, but were not clinically practicable because of their complication, lack of portability, and cost.

Dr. Clarke concluded by describing his own procedure in testing, after which the three papers were discussed together.

In the discussion which followed, Mr. O. POPPER said that nobody had yet suggested a unit which everybody accepted; probably the President used one which was arbitrary. He agreed that absolute bone conduction was the only reliable test obtainable with the tuning-fork. He asked what means were adopted for ensuring that the tuning-fork was maintained at a constant distance from the ear. Also, could one always assume that the examiner's ear was normal? His criticism was that two systems were introduced—those of distance and time.

Sir JAMES DUNDAS-GRANT said that in carrying out tuning-fork tests there were many details, not brought out in the present discussion, which the thoughtful practitioner would have in mind. One was the factor of weight in the fork. A heavy fork was not calculated to give very satisfactory results for bone conduction. He agreed that the middle C (256 double vibrations per second) was the best fork to test with, but even forks of that note varied.

Mr. F. J. CLEMINSON regarded the Rinne test as entirely unnecessary.

Mr. ALEX TWEEDIE considered that Dr. Love's classification was a remarkably good one for educational purposes. But with regard to the 20 ft. whispering distance the speaker thought this should rather be taken as an arbitrary line between children requiring special treatment and children needing education in ordinary schools.

Mr. G. J. JENKINS said that for a long time the Bing test had been his great stand-by in arriving at an estimate of a patient's bone conduction. If one sounded a tuning-fork and then interfered with the low tones the high tones would be heard less distinctly. The great difficulty in measuring the hearing capacity with tuning-forks was to place the fork in the same position and at the right angle in each case. The least twist of the fork caused an appreciable difference.

Mr. A. J. STORY (National Institute for the Deaf) complained that at present one found children with all kinds of history and all degrees of deafness planted in the same school, often in the same class. The Institute wished to get a terminology of deafness which was based on the history and the degree of deafness, and which was intelligible to the ordinary teacher as well as to the medical practitioner. Dr. Love's classification would be very helpful in recommending to parents how best the child could be properly taught.

Mr. A. R. SHARPE (Leeds), speaking of his connexion with a deaf-and-dumb school, said Dr. Love's classification was a very sensible and sound one. One type met with was he who was truly mute, but was not a deaf-mute; he would apply to these the term "pseudo-deaf-mute," a child who heard but neither understood nor spoke, probably because of some fault in the cerebral system, such as auditory aphasia.

The openers replied briefly, and the Section then proceeded to the discussion of clinical cases.

SECTION FOR THE STUDY OF DISEASE IN CHILDREN.

AT a meeting of this Section on Nov. 5th Dr. F. J. POYNTON, the President, took the chair, and a paper was read by Dr. L. S. T. BURRELL on

FIBROSIS OF LUNG.

As many chronic pulmonary diseases began during childhood it was important, he said, to recognise and treat the various catarrhal conditions found at that period. Tubercle of lung was uncommon in infants, except as part of a general tuberculosis. During the first few years of life the mortality from tubercle was high, but afterwards it fell rapidly, until at the period between the seventh and sixteenth years it was very small. After 16, however, the mortality from the disease rose, reaching its maximum round about the fiftieth year; the mortality varied in different countries. There were three age-groups which could be usefully recognised in regard to tuberculosis: (1) the first five years of life, when general and surgical tuberculosis was common, pulmonary tuberculosis rare; (2) from 7 to 16 years, in which all forms of tuberculosis were rare; and from 16 to middle age, when the disease became more common, but was of a different type from that displayed by the child, in the savage, or in the inoculated guinea-pig. Tuberculosis of glands at the root of the lung was often present in children, but his experience had been that it was exceptional for the tissues of the lung to become subsequently infected. Therefore when one encountered a child with signs of tuberculosis in the glands of the chest there was no real reason for supposing that he would have pulmonary tuberculosis. Dr. R. C. Wingfield, at Frimley Sanatorium, had examined 160 hardened specimens of the contents of the thorax of children who had died from various causes in St. Thomas's Hospital, and had found macroscopic evidence of tuberculosis in the glands at the root of the lung in 17½ per cent., an observation which microscopical examination had confirmed. In these cases of tuberculous bronchial glands the disease normally became arrested, leaving as a sequel calcareous glands but no pulmonary affection. In some of the cases the children were listless, poisoned by the tuberculous toxin, but often there was little evidence of impairment of general health. When a child's lung was infected, there was a tendency to activity and rapid spread. The early case in the child did not necessarily show tubercle bacilli in the sputum, and they were absent, too, in late stages when fibrosis had occurred. Still, if the child caught a definite cold or had an attack of bronchitis the bacilli could be found in the sputum. Before the fibrotic change the child had probably been running about and playing like other children.

In the adult when there were signs at the apex of the lung it was assumed that their origin was tuberculous, and generally this was a correct assumption. But it could not be applied to children. On following up children who showed signs at the apex, or pneumonia, it was found that in a considerable proportion the behaviour was not that of tubercle. Hence in the case of a child with an acute apical lesion it was safe to give a better prognosis than could be given

for an adult in a similar situation. The kind of patient he was referring to was one who was suddenly taken ill with what was called pneumonia; the signs were at the apex of one lung only, but the condition did not settle down like a pneumonia, and after three or four weeks there was still a temperature, up in the evening, down in the morning. Eventually the temperature came down by lysis, and the signs disappeared. Was it tubercle? The tuberculin tests employed had, in his experience, the great disadvantage of being positive in many cases in which clinically there was no tuberculosis. A negative test was more valuable. If such a child had a tuberculous lesion, what had happened? Probably he had a small tuberculous infection, and then added to that was a fresh infection, giving a focal reaction. The same kind of thing could be seen in the adult. It was easier to understand the course if the second infection was caused by some organism other than the tubercle bacillus. His own feeling was that the majority of these cases of children who had an apical or other lesion which subsequently cleared up were non-tuberculous. Still, tuberculosis played an enormous part in the causation of fibrosis of the lung.

It was the catarrhal conditions which were so important, not only from the standpoint of the individual child, but also from that of his associates, especially in the same family. These led also to bronchiectasis. The main causes of catarrh in children were measles, influenza, whooping-cough, the chief of these being measles. In 1925 there were over 94,000 deaths of children under 15 years of age in England and Wales, and more than 20,000 of them were due to non-tuberculous respiratory diseases. For pulmonary tuberculosis the figure was 1500, and for other forms of tuberculosis 5000. It was very important that the non-tuberculous respiratory diseases should be recognised. And it might be expected that these non-tuberculous diseases would leave behind them fibrotic and other changes.

In lobar pneumonia there was an exudation which was as a rule completely absorbed when the patient recovered. It was the broncho-pneumonia following influenza and measles which caused destruction of bronchial membrane and lung tissue; there was healing by scar tissue, and the healing was not complete, cases of "unresolved pneumonia" being of this nature. Thus it must be remembered that it was the broncho-pneumonic type of disease which was accountable for the cases of fibrosis. In children who had repeated attacks of bronchitis it was often found that the same part of the lung was attacked in each illness; and this could not be dismissed as a coincidence. Usually—and this was important from the standpoint of prevention—these children who had frequent colds and bronchial attacks had brothers and sisters who were known to be "chesty." Therefore if the first case in a family were treated thoroughly, there would be a good chance of lessening the total incidence of the states under discussion. The damage present after the onset of bronchiectasis could not be repaired. Much could be done before the onset of fibrosis: all sources of infection, such as tonsils, teeth, the gastro-intestinal tract, should be treated; Dr. Burrell advocated the use of a vaccine (autogenous if possible), as in his view it was more useful in childhood than in adult life. The giving of a vaccine seemed, both in hospital and in schools, to lessen the incidence of catarrhal and bronchial colds. He started very gradually, using 0·1 c.cm., and working up to a dose which caused a reaction, but never going beyond 1·0 c.cm. Dr. Burrell had a great belief in a long holiday for these children, the place and circumstances varying somewhat with the particular child's temperament. They should be kept out of hot stuffy rooms, and should be under rather than over-clothed. Many such children had intestinal toxæmia too.

Another group, surgical rather than medical, was that in which fibrosis followed empyema. It was now treated in a special way surgically, and it did not therefore lead to the serious fibrosis formerly seen as a sequel.

Discussion.

Dr. A. G. MAITLAND-JONES thought it should be emphasised that tuberculosis was a somewhat rare cause of fibrosis of the lung in children. Some talked of a condition termed "epi-tuberculosis," and he would like to hear more about that. He referred to the kind of case in which a child came with what seemed to be pneumonia; the illness lasted one or two months, with a fever, and then the temperature fell to normal, and physical signs of dullness remained in one or other lobe, perhaps with some crepitations. The condition might be thought to be fibrosis, but after persisting for two, three, perhaps five months, the signs cleared up completely. Was it justifiable to say that fibrosis was present?

Dr. HILDA STOESINGER spoke of the lessons learned in following up consecutive cases of broncho-pneumonia and allied conditions admitted to the Royal Free Hospital. Repeatedly she had noticed that cases with symptoms of localised pulmonary catarrh were occurring every two or three weeks. In a large proportion of cases of both lobar pneumonia and broncho-pneumonia there was a family history of contact with others having respiratory disease. Of 32 consecutive cases of lobar pneumonia 22 had a past history of recurrent bronchitis or pneumonia, and 16 had a family history. Of 34 consecutive cases of broncho-pneumonia 19 had a past history (no statement in 3) and 17 had a family history. These figures pointed to the importance of carefully supervising all cases of pneumonia whose clinical course resembled that of lobar pneumonia. She raised the question of the value of X rays in the diagnosis of these conditions.

Dr. C. D. S. AGASSIZ, speaking of experience in an institution with 350 beds for tuberculous children, said he thought that pulmonary tuberculosis in children was not uncommon; he found that a third of the cases of the pulmonary form showed the bacilli in the sputum. Was it Dr. Burrell's experience that in fibrosis of the lung the signs were most marked at the base of the lung? He himself had found that they were. Sometimes both bases were involved; the signs cleared up quickly, but came back again.

Dr. H. E. A. BOLDERO spoke of the good work done for these children in infant welfare centres, and said he would like to hear more about preventive measures. It was easy to suggest an out-of-door life and isolation from cases of coryza, but it might be well to persuade mothers wholesale to agree to inoculation with serum.

Dr. J. WATT raised the question of what happened to children who had non-tuberculous fibrosis of the lung, as the condition was seldom seen in the adult. Did such children succumb in adolescent or early adult life? Did they or did they not develop bronchiectasis? Or was tubercle grafted on to their fibrosis?

Dr. A. G. PHEAR spoke of children who had very definite signs in childhood, but later lost those signs. He thought a case of slowly resolving pneumonia, seen for the first time, might easily be regarded as a permanent fibrosis or bronchiectasis.

Dr. G. A. SUTHERLAND held that it was quite exceptional for fibroid lung to end in bronchiectasis. Lobar pneumonia probably never led to fibroid lung; a large number of cases of the latter condition, in his experience, recovered. Fibroid lung seemed to be a local disease—i.e., one arising in the lung itself—and the pathologist could usually find several organisms, such as streptococcus, the *Micrococcus catarrhalis*, and the influenza bacillus. With children living the life they did in London it was not surprising that among the organisms found was the tubercle bacillus. His own view of the ultimate fate of children with fibrotic lung was a favourable one.

Dr. F. PARKES WEBER questioned whether typical recurrent attacks of clinically slight pneumonia had ever led to fibrosis of the lung; he was sceptical on the point.

The PRESIDENT said he supposed that, apart from rheumatism and tuberculosis, fibrosis of the lungs

was one of the most important of children's diseases. The way some of the cases recovered—even those with extensive fibrosis and displacement of the heart—was surprising. Perhaps the signs heard suggested that the lesion was more extensive than it actually was. He had seen the experimental work done by Mr. Morriston Davies and others in earlier days, and had been astonished to see how, after the phrenic nerve had been torn away and ribs resected, recovery took place up to a certain stage. He agreed about the fine preventive work being done by infant welfare centres, and about the frequency with which infection in one part of the lung lit up time after time with fresh catarrhal visitations. He had particularly wished to have the surgical aspect of empyæma discussed, as for a number of years he had been working at the avoidance of open operation for these cases, substituting for it some form of closed surgery. Seeing how damp and miserable were some of the homes of these children, the number of recurrent attacks of respiratory disease was not surprising. He was not a great believer in vaccines.

Dr. J. S. JOULE raised the question of diagnosis as between collapsed lung and fibrosis of lung, and asked whether investigations with lipiodol had been made.

Dr. BURRELL briefly replied.

HUNTERIAN SOCIETY.

AT a meeting of this Society held at the Cutlers' Hall on Nov. 5th, under the presidency of Dr. A. WESTERMAN, a discussion on

THE DOCTOR ON THE STAGE

was opened by Mr. WILLIAM DEVEREUX, who said that doctors he had played on the stage always looked preternaturally wise and never knew what was the matter with the patient. Was that lifelike? In both professions all that was necessary was a good bedside manner, and a great deal depended on the audience. The actor took off his hat to the doctor because he was always willing to use his skill for nothing, night or day, in the service of humanity. He belonged to a profession that—whatever its rewards—would always be underpaid.

Lady SIMSON (Miss Lena Ashwell) spoke of "The Doctor's Dilemma" as a fit companion to Shaw's latest book, "The Intelligent Woman's Guide to Socialism"; their value as a serious contribution did not amount to the row of pins mentioned in the book. There were many points of similarity between the drama and medicine. The University of London had now recognised the importance of drama in the life of the people by instituting a diploma of dramatic art. From recent papers in the examination for this diploma she selected the following as of interest to medical men:—

1. For the physician: "Discuss the significance of Aristotle's theory of catharsis." 2. For the alienist: "Discuss heredity as treated respectively in any Greek or modern play." 3. For the orthopædic surgeon: "Give an account of the principal changes in boots and shoes from William the First to Elizabeth." 4. For the New Health Society: "Describe the method of preparing and the dishes served at a banquet given by (a) Richard II., (b) Cardinal Wolsey, (c) Charles II." 5. For the anatomist—and she would ask any member of the audience who could answer it to raise his hand: "Explain the various mechanisms of the body whereby balance is maintained."

Team-work was vital to both arts: the production of a play required the coöperation of a large number of specialists in different lines, and on the stage there was also the all-round man who played in repertory and could be compared with the family physician. The medical profession was far better organised than the dramatic. The part that could be played by the dramatist in the well-being of the nation was in every respect comparable with that played by the doctor—the mind was, of the two, more important than the body. The body was well guarded by the Government: there was a General Medical Council, a Ministry of Health, medical officers of health, and poor-law hospitals, but at present nothing was done to protect the public's artistic life. She looked to the day when there would be a Ministry of Fine Arts and a national theatre, and when every town should have its dramatic building, belonging to the people and ensuring that the mind of the people should be safely guarded. It was impossible to over-emphasise the necessity for looking after this side of human life. Miss Ashwell spoke of her work in the war, and said that one experience was deeply engraved in the feelings of all her 600 helpers, that the great mass of the army liked the very best things; it was impossible to give them anything too good if it could be given well. The idea that the masses really preferred bad things was not true. They had found that the work of music and poetry and plays was definitely healing. Drama was the only way of bringing to people some vision of other people's lives. Immensely important questions that could not be broached on a political platform could be discussed through the medium of a play like "The Skin Game," where both sides were put in the form of struggling human feeling. Often that was the only opportunity the audience ever had of seeing both sides. Miss Ashwell related the story of a mutiny checked by the playing of "Candida," and of a fierce clerical opponent of the drama who found his healing from intractable war-obsessions, which church and hospital alike had failed to cure, in Barrie's "Dear Brutus." She begged doctors to think of this side of mankind that could only be fed by the arts, and to work for the day when the majority could have, at a price they could afford, the very best music, the very best plays, and the very finest kinema, instead of the constant reiteration of murder, of thieving, and of debased sex problems which were not the best thing for our older civilisation.

The Doctor in Shakespeare.

Sir STCLAIR THOMSON deplored the misunderstanding between sexes, classes, ages, and professions, and quoted Huxley's definition of heaven as "a place where I shall no longer be misundertood." All classes, ages, and professions were very often misrepresented on the stage. Shakespeare had rather made fun of doctors up to King Lear, which was written in 1606, but in that play the doctor was a highly honourable and sympathetic character. In 1607 Shakespeare's daughter had married Dr. Hall, and it might be that the son-in-law had opened his father's eyes to the difference between properly qualified men and mountebanks, both inside and outside the profession. No surgeon appeared in a Shakespearian play, although Lear said "Let me have a surgeon; I am cut to the brains," and Portia warned Shylock: "Have by some surgeon, Shylock, on your charge, to stop his wounds lest he do bleed to death." Physicians appeared seven times in the 36 plays. In "Macbeth" there were two—an Englishman and a Scotsman. The former made a speech about the cure of scrofula by the royal touch:—

> There are a crew of wretched souls
> That stay his cure; their malady convinces
> The great assay of art; but at his touch—
> Such sanctity hath heaven given his hand—
> They presently amend."

The Scots doctor was very canny. "I will set down what comes from her," he said, "to satisfy my remembrance the more strongly." And, "I think, but dare not speak," he said. It had been suggested that he was a timid man, trying to hand on a difficult patient to another practitioner: "more needs she the divine than the physician," regarding her as a criminal and declaring himself unable to minister to a mind diseased. There was no disparagement to the art and science of medicine in Shakespeare's distrust of physic, for to

> "pluck from the memory a rooted sorrow, raze out the written troubles of the brain and with some sweet oblivious antidote cleanse the stuff'd bosom of that perilous stuff which weighs upon the heart."

What could be better than auto-suggestion, wherein "the patient must minister to himself"—a method of

recent recognition, but advocated by Shakespeare all those years ago. Macbeth, being a man of action, little given to reflection, called for his armour and his staff and threw "physic to the dogs." Another Shakespearian physician was Dr. Butts, in "Henry VIII." The original of this character was Dr. William Butt, Fellow of Gonville and Caius College, Cambridge, and of the College of Physicians, a man of great repute at court. Cornelius, in "Cymbeline," played a difficult part with great honour and astuteness when the queen asked him for poison. He reproved her with dignity, and when she insisted—and he could not disobey a royal command—he gave her a comparatively harmless drug, not trusting her statement that she required it for animal experimentation only. Doctors might ever lay this flattering unction to their souls that nowhere in the whole of literature was found a nobler panegyric than the words of Cerimon in "Pericles":—

"I hold it ever,
Virtue and cunning were endowments greater
Than nobleness and riches; careless heirs
May the two latter darken and expend;
But immortality attends the former,
Making a man a god . . .
And I can speak of the disturbances
That nature works, and of her cures; which doth give me
A more content in course of true delight
Than to be thirsty after tottering honour,
Or tie my treasure up in silken bags,
To please the fool and death."

The Doctor on the Contemporary Stage.

Mr. IVOR BACK investigated first the dramatist's conception of life in Harley-street—for the dramatist, he said, the only street. Fruitless to protest to him that large fortunes had been accumulated in Brook-street or in Cavendish-square; he would not believe you. This street was long enough in real life—it had 145 houses—but on the stage it had nearly a thousand. In a recent play a surgeon had lived at No. 915. This immense and dreary avenue was peopled entirely by surgeon-baronets. In fact the surgeon-baronet was a comparatively rare bird, and many of them dragged out their miserable existence in the remoter recesses of provincial towns. To the dramatist the dweller in Harley-street was always a surgeon. Why? The reason was that the surgeon was the last of the great romantics. The soldier, the poet, the painter had had their day, but the surgeon was still to the public a queer romantic creature who spent most of his time doing operations of extraordinary gravity in which a slip of one-sixteenth of an inch to one side or the other meant the life of the patient. Admittedly it was difficult to introduce on the stage any complaint so hateful as the homely hæmorrhoid or so humdrum as the humble hammer-toe, but in real life the surgeon was called on to deal with these quite as often as with the graver abdominal lesions. Often the surgeon—although described as such in the programme—did not act like a surgeon at all, but indulged in the behaviouristic vagaries associated with the physician; he carried a stethoscope, he listened to chests, he talked, and he administered poisons. The stage surgeon nearly always had a large family of grown-up sons and daughters and led a kind of communal existence with them in one living room. If this room had a knee-hole desk with a stethoscope on it it was a consulting-room; if it had a grand piano it was a drawing-room. Whichever it was, it was peopled indiscriminately throughout the play by the surgeon, his family, his servants, and his patients. In one play Mr. Back had seen a patient examined in the presence of 11 other people, including one butler and one kitchen maid. If an operation was to be performed the stage surgeon rang up a random number and ordered a nurse, without any question as to whether one were available or not. No one who had tried to get a surgical nurse at midnight for an emergency would need to be reminded of the real facts. On the stage the nurse arrived in a second or two, without cap, cloak, or luggage. In one play she had bounced on, turned on a gramophone, and danced a Charleston with the surgeon before making a single inquiry about the case. In another the operation had been performed in a small room leading off the drawing-room, the audience being allowed to see a few towels and tin pans through the communicating door before the curtain mercifully fell. The great authors, other than dramatists, gave his due to the general practitioner, the devoted slave of the great British public and their guide, philosopher, and friend. He would add to the panegyric quoted by Sir StClair Thomson the words of Robert Louis Stevenson:—

"There are men and classes of men that stand above the common herd, the soldier, the sailor, and the shepherd not infrequently, the artist rarely, the clergyman more rarely still—the doctor almost as a rule. He is the flower, such as it is, of our civilisation, and when that stage of man is done with he will be thought to have shared as little as any in its defects. Generosity he has, such as is possible to those who practise an art, never to those who drive a trade; discretion tested by a hundred secrets; tact tried in a thousand embarrassments and, what are more important, herculean cheerfulness and courage, so that he brings air and cheer into the sick-room and often enough, though not so often as he wishes, he brings healing."

By the dramatist he was represented either as what the French called a "faux bonhomme"—a man full of beans, benevolence, and bunkum—or as a frank buffoon, or thirdly, as a venal scoundrel in the pay of the villain with a bottle of chloroform in his pocket. This he administered to his victims on a handkerchief, producing in two seconds a profound anæsthesia and complete muscular relaxation. The speaker wished that he would teach his technique to some of the surgeon's anæsthetist colleagues. There were innumerable examples of irresponsibility in nomenclature and technique, such as the "jugular artery" and operations on the head which in five minutes altered the patient's entire character. These errors might be avoided by invoking the assistance of a medical man. Sir Henry Irving, who had been very particular about accuracy, had once called on the two leading doctors of his time to assist him in a production. At the dress rehearsal these gentlemen were in the stalls, and a stage carpenter had been heard to murmur: "Sir 'Enery Irving, Sir H'Andrew Clark, Sir Frederick Treves—three blinking knights—and that's what the blinking play will run." Medical coöperation could not therefore be relied on to ensure success.

Mr. P. COLE remarked that the actor gave the public medicine just as the doctor did, but in a much more palatable form. The building in which the present meeting was being held had most interesting historical connexions with both professions.

Dr. CAMPBELL MCCLURE said he had never seen a stage doctor use the old-fashioned straight stethoscope with his ear at the right end. Another thing that had struck him was the ease of prescribing; the stage doctor dashed off a most complicated prescription in a few seconds, adding the words "two tablespoonsful in a draught of water three times a day after meals" with a single stroke of his pen. He pleaded for a little leniency and a little study on the part of great dramatists who presented medical men on the stage.

The President then called upon Dr. J. W. EYRE to propose, and Dr. T. B. HYSLOP to second, a vote of thanks to the speakers. The latter mentioned the difference between insanity as portrayed on the stage and as seen within the walls of Bethlem.

GREAT ORMOND-STREET HOSPITAL FOR SICK CHILDREN.—Mr. H. P. Macmillan, the chairman, and Lord Warrington of Clyffe, the vice-chairman of this hospital, have written to the press lamenting "the imminent failure" of the project for transferring it to the site of the Foundling Hospital. "The reason," they say, "is solely the want of money," the sum required being £600,000.

BECONTREE HOSPITAL.—It is proposed to erect a general hospital of 300 or 400 beds at Becontree, the new "dormitory" town by Ilford. King Edward's Fund have promised to contribute £10,000 towards the cost if voluntary contributions amounting to at least as much are forthcoming, and the Housing Committee of the London County Council (the owner of most of the houses) is recommending the Council to contribute a further £10,000.

Reviews and Notices of Books.

TOXINS AND TOXOIDS.

Handbuch der Biologischen Arbeitsmethoden: Abt. XIII., Teil 2, Heft 7. Edited by E. ABDERHALDEN.

Toxine und Toxoide. By E. LÖWENSTEIN, Vienna. Berlin and Vienna: Urban and Schwarzenberg. 1928. Pp. 109.

THE determination of the chemical constitution of toxin and of the chemistry of specificity are the main problems that allure and still baffle the immunologist. Obermayer and Pick, Landsteiner, Avery, and others have applied biochemical methods to the purification and separation of toxins, and this has led to the identification of the interesting haptenes, which react with antigens in vitro, but are not themselves antigenic when given alone; these workers and others have prepared the chemically altered specific antigens, diazo and nitrated protein antigens. Further interesting light on specificity comes from the racemisation work—though the author apparently does not mention it—of H. Dakin and H. W. Dudley. A difficulty in investigating the properties of toxins is that, like ferments, they seem to become more unstable the more they are "purified." Dr. Löwenstein confesses that we are not much nearer the solution of the problems connected with them than we were 30 years ago. The author deals mainly with typical toxins such as those of diphtheria and tetanus and their modification by physical and chemical means into toxoids, and with tuberculin. He deals at some length with the persistent quest of the immunologist to obtain a body which may be completely free of toxicity and yet will on injection give rise to protective antibodies. Ehrlich's unsuccessful attempts with iodine and Löwenstein and Eisler's work in Austria with iodine, and with formalin coupled with light or heat, from 1903 onward, are described at some length. These relate mainly to tetanus toxin. Ramon, in 1923, reinvestigated the process and, by formalinisation with heat, came nearer to success than any of the previous German workers in making a diphtheria toxoid and later a tetanus toxoid free of all toxicity but antigenic in character. Questions of priority are generally unattractive, but it is perhaps well that the history of formalinisation of toxin should have been put on record by Dr. Löwenstein. This record, together with the mention of the use of formalinised diphtheria toxin long prior to 1923 by A. T. Glenny and H. J. Sudmersen in this country, sets out the history of the investigation of the interesting and puzzling action of aldehydes—pre-eminently formaldehyde—on toxins. The chemistry of this action is still not clear.

Ramon's great contribution to immunology—the flocculation method—is well described. Dr. Löwenstein, after expressing his feeling that the French school did not carry out sufficient parallel researches on the determination of the binding value (or L+), does not share Ramon's conviction that the flocculation value of toxin or antitoxin is practically the only important measure of immunological value. He does not discuss the latest work, notably of Glenny in London and P. J. Moloney and colleagues in Toronto, which seems to suggest that though the flocculating value, Lf, is at present the best ascertainable value of a toxin, it is not a complete expression of its immunising value, nor is the flocculation value always the true value of an antitoxin as measured in the classical Ehrlich method. The challenge to this latter method of measurement by R. Kraus and by Th. Madsen, who suggest that the "avidity" of an antitoxin is of more importance than the Ehrlich unitage, is mentioned. In the course of a discussion of various methods of active immunisation with toxin-antitoxin mixtures and toxoid, the author mentions that immunisation against diphtheria has been compulsory in schools in U.S.A. So far as we know this is erroneous; any introduction of compulsion in connexion with this particular method of prophylaxis might well set back the clock.

Considerable attention is given to dissociation of toxin-antitoxin mixtures, and the author concludes this section with a rapid review of formalinised dysentery and gas-gangrene toxins, snake poison, abrin, and so forth. The final section describes the making and testing of tuberculin with a short description of the two components, the carbohydrate body of H. Zinsser and P. P. Laidlaw, reacting in vitro, and the purified tuberculin of F. Seibert and E. R. Long with its specific toxicity.

Though the bibliography is not as full as the specialist in this field would wish, this monograph is one which every immunologist will desire to have in his library.

THE PURDAH SYSTEM AND ITS EFFECT ON MOTHERHOOD.

Osteomalacia Caused by Absence of Light in India. By KATHLEEN OLGA VAUGHAN, M.B. Lond., sometime Superintendent of H.H. the Maharajah of Yammu and Kashmir's Diamond Jubilee Zenana Hospital, Srinagar, Kashmir. Cambridge, England: W. Heffer and Sons, Ltd. 1928. Pp. 48. 2s. 6d.

Miss Vaughan's little book is not a scientific treatise, but is an effort to show what an immense amount of unnecessary suffering the purdah system lays upon women in India. When purdah is strictly observed there is an almost complete lack of exposure of the skin to direct sunshine. Osteomalacia is very frequent, particularly among women of the child-bearing age, and Dr. Vaughan correlates its incidence with the lack of direct sunshine. The various claims of deficiency in light or in diet as the causal agent are discussed, and the author concludes that lack of light is the prime cause. If the osteomalacia described is really due to an avitaminosis with vitamin D, as it seems clear that it is, then it should certainly be curable by increased light; but it should also be curable by a better diet. One might put it that the light is insufficient when so poor a diet is consumed, or conversely that the diet is too poor when exposure to light is so deficient. It is unfortunate that so many writers still make an antithesis where none in reality exists. No doubt Dr. Vaughan is really tilting against the purdah system and would sooner see it abolished than insist on an alteration made in the dietetic habits of those who use it. From the point of view of prevention of osteomalacia the essential factor is the provision of vitamin D, and if this is easier to procure by advising alteration of dietetic habits than by urging the abolition of the purdah system, the more practical means of reform should be adopted.

THE CONQUEST OF LIFE.

By SERGE VORONOFF, M.D. Translated by G. GIBIER RAMBAUD, M.D. London: Brentano's Ltd. 1928. Pp. 201. 15s.

Dr. Serge Voronoff has written many works for the profession. He now turns his attention to the laity. His latest work is a popular exposition of the author's method of rejuvenation by means of grafts. It is, of course, natural that the public should desire to be kept informed of important advances in science, and there could be no advance of greater importance than one which claims to have the effect of postponing the ills of old age. It is doubtful, however, whether a book from the pen of an enthusiast concerning results which are still doubted by the majority of scientific men is to be welcomed. Interesting and important as are Dr. Voronoff's findings, they have not been accepted in their entirety by the medical world. The deputation of biologists and veterinary experts who recently visited the experimental farms in Algeria returned interested but unconvinced that Dr. Voronoff had proved his tenets. Many of his experiments lacked proper controls and no precautions

had been taken to guard against unconscious selection. Moreover, although numerous cases have been recorded of improvement in health and increase of vigour following the implantation of testicular grafts in human beings, the results of these operations are by no means constant. His work, therefore, is yet in the experimental stage, and a popular exposition written in the vein of "The Conquest of Life" is somewhat premature. It will arouse various hopes in the minds of those who dread the arrival of old age. Life has not yet been conquered, and the hope that has ever been present in most hearts of finding the fountain of youth is still only a hope. Nevertheless Dr. Voronoff's book is stimulating. Some of his results cannot be put aside. The case of Jackie the Bull, who has twice been grafted and has now reached the age of 20 in apparent good condition, is sufficiently remarkable to make a sceptic pause and think. "The Conquest of Life" will not appeal to sceptics; but if, as the publishers' note puts it, it is meant to be "a narrative of surprising interest, as gripping as a best seller and as full of surprises as a mystery story," then the author has achieved his object.

THE GLORY OF DISCONTENT.

Studies in Modern Social Problems. By F. TUDSBERY. London: H. F. and G. Witherby. 1928. Pp. 232. 7*s*. 6*d*.

THE author of this little book is neither bolshevist nor cynic, but an amiable man who thinks that our relations with God and with one another might be much better than they are. He has written a series of pleasant simple essays to suggest that conventionality can be carried too far. These essays are not argumentative; the author tries always to see the third side of every question with a gentle reasonableness which many people will find helpful. It is a pity that he misquotes Wordsworth. The book would be welcome to many a convalescent.

JOURNALS.

JOURNAL OF PATHOLOGY AND BACTERIOLOGY. Vol. XXXI., Part 4. Pp. 597–930. October, 1928.—The Gram-negative Cocci of the Nasopharynx with a Description of *Neisseria pharyngis*, by G. S. Wilson and M. M. Smith (London). The classification and differentiation of these cocci are extremely muddled and unsatisfactory; several supposed species are united under a new name.—Tumours of the Skin and Mammary Glands caused by Pyrogenous Products of Cholesterol, by E. L. Kennaway and B. Sampson (London). "Tar" produced by heating cholesterol to about 800° C. is carcinogenic in mice (skin) and rabbits (mammary gland).—The Pathogenic Values of Pneumococcal Types: the Lesions Produced in Relation to Virulence, by J. F. Gaskell (Cambridge). The pathogenicity of Type II. and Type III. strains is lower than that of Type I. and the lesions produced are milder; Group IV. contains some strains which are highly virulent and pathogenic.—The in vitro Titration of *B. welchii* Antitoxin by its Antihæmolytic Power, by J. H. Mason and A. T. Glenny (Beckenham). The method gives as good results as the direct toxin test in mice.—Histamine and Infection, by G. M. Findlay (London). Injections of histamine determine local infection by various bacteria and viruses; this is the explanation of the clinical association of trauma with, e.g., osteomyelitis and tuberculosis.—Polycythæmia in the Rabbit Following Operations Involving the Peritoneum, by R. H. Mole (Moukden). A moderate degree of polycythæmia follows four different operative procedures, under ether or novocaine anæsthesia, involving the peritoneum.—A Case of Endocarditis in Man Associated with *Bacillus parainfluenzæ* of Rivers, by D. S. Russell and P. Fildes (London). A girl of 18 with a rheumatic history. The anatomy and bacteriology are fully described.—Giant-cell Tumours of Bone in a Fowl, by S. L. Baker (London). Two osteoclastomas: transplantation failed.—Neuroblastoma of the Suprarenal Glands, by N. B. Capon (Liverpool). An example of the Pepper type of adrenal tumour with a review of the literature.—The Relation of Agglutination by Specific Serum to Agglutination by Acid, by J. A. Arkwright (London). In the typhoid group the flagellar and somatic agglutinable substances react with acid at different zones of hydrogen-ion concentration.—The Action of Immune Serum on Vaccinia and Virus III. in vitro, by C. H. Andrewes (London). Immune serum which is highly potent in preventing infection does not destroy vaccinia virus in vitro; there is no evidence of a stable antigen-antibody union, and a neutral mixture may be reactivated by simple dilution.—Capillary Permeability in Acute Uranium Nephritis, by the late Caroline Whitney (St. Louis). Uranium poisoning diminishes the permeability of the capillaries so quickly that it may be presumed to act directly and not through its nephritic effect.—Experiments on the Production of Hyperplasia in the Alveolar Epithelium of the Lung of the Rabbit, by J. S. Young (Leeds). Active proliferation of the epithelium of the marginal alveoli is caused by the intrapleural injection of sodium, calcium, strontium, and aluminium salts in proportion to their valencies.—The Appearance of Doubly Refracting Substances in Formalin-fixed Rabbit Tissues, by J. B. Duguid and J. Mills (Cardiff). Tissues which are apparently thoroughly fixed in formalin develop myelin substances on keeping in a slightly acid medium.—The Oxygen Tension Necessary for the Mitosis of Certain Embryonic and Neoplastic Cells, by G P. Wright (London). In tissue cultures the lowest concentrations of oxygen at which cell division continues are for chicken heart myoblasts about 1·6 per cent., for Jensen rat sarcoma 0·8 per cent., and for a mouse carcinoma 0·4 per cent.—The Relationship Between the Bactericidal Power of Normal Guinea-pig Serum and Complement Activity, by J. Gordon and Arthur Wormall (Leeds). Hæmolytic complement and bactericidal complement are probably identical; normal guinea-pig serum contains a bactericidal immune body.—Fixation of Complement by *B. typhosus* and Normal Guinea-pig Serum, by E. M. Dunlop (Glasgow). An interesting and useful study of natural antibody.—Chordoma of the Vertebral Column with Three New Cases, by D. F. Cappell (Glasgow). Two cervical and one dorsal case. The condition is related to the embryonic history of the notochord.—The Blood Changes After Splenectomy in Splenic Anæmia, Purpura Hæmorrhagica, and Acholuric Jaundice, with special reference to Platelets and Coagulation, by W. Howel Evans (Liverpool). The platelets and blood coagulation time were studied before and after splenectomy in ruptured normal spleen (one case), splenic anæmia (five), purpura hæmorrhagica (four), and acholuric jaundice (two). Except in one case of purpura there was a considerable rise of platelets and a diminution in coagulation time after splenectomy.—The Relation of the Blood Platelets to Thrombosis after Operation and Parturition, by R. Y. Dawbarn, F. Earlam, and W. Howel Evans (Liverpool). After many surgical operations and after childbirth the platelets in the blood begin to increase about the fourth day, reach a maximum about the tenth day, and then decline to normal. This is causally related to post-operative thrombosis.—The Types of Tubercle Bacilli in Human Bone and Joint Tuberculosis, by A. S. Griffith (Cambridge). In 598 cases bovine bacilli were found in persons of all ages in 20 per cent., in children under 5 in 33 per cent., in children between 5 and 10 in 24 per cent.; no case over 23 years yielded bovine bacilli. There is inconclusive evidence that bovine bacilli account for a relatively larger proportion of spinal cases.—*B. proteus* Infections, by J. F. Taylor (London). The organism is more pathogenic than is often supposed and is the active agent in a number of urinary and suppurative lesions.—A Sacral Neuroepithelial Tumour of Fœtal Origin, by W. Susman (Manchester).—Obituary notices of W. H. Ferguson (portrait) and G. R. James.—Book received. Title page and indexes.

THE LANCET.

LONDON: SATURDAY, NOVEMBER 10, 1928.

USE AND ABUSE OF COUGH.

How the secretions of the bronchial tree are brought up to the surface from the depths of the chest is the well-chosen subject of the Schorstein lecture which appears at the front of our present issue. In this lecture Dr. CECIL WALL deals in a learned and comprehensive manner with the facts and theories of respiratory movement, and in particular with the cough which is the final chapter in the physiological process of expectoration. Expectoration, he says, is effected by raising the intrapulmonary air pressure and then suddenly allowing the air to escape and carry with it any peccant matter that may be lying in the air passages, and he makes it clear how this mechanism can be put to the best advantage under various conditions. He does not deal in this lecture with the ciliary movement, described long ago by GOSSELIN, which is the first act of expectoration and was the subject recently of some very interesting experiments reported in our columns by Dr. LEONARD HILL (Oct. 20th, p. 802). SHARPEY showed that the direction of ciliary movement in the air passages of mammals and birds is towards the larynx. Dr. HILL does not state so definitely, but it may be assumed that the fact of ciliary movement and its direction holds good also in human beings. In an inquiry into the factors which govern ciliary movement he shows very clearly that the movements of the cilia can transfer, in a comparatively short time, secretion and foreign particles to the rima glottidis. The cilia act best in a neutral medium, their movements cease in acid or alkaline solutions, but begin again when sufficient alkali or acid is added to produce neutrality. The rate of transit when the trachea is horizontal is twice as fast as when it is vertical. Further, ciliary action is accelerated when the membrane is evenly stretched. Extensive damage to the membrane has the effect of stopping the movements of the cilia. Drugs applied locally vary in their effect. Solutions of ammonium chloride, absolute alcohol, oil of eucalyptus, caffeine, urethane, watery infusions of opium or belladonna apparently have no effect on the ciliary movement. Mercuric chloride, mercury alanin, carbolic acid, and arsenical war-gas fumes either slow the movement or abolish it altogether. Chloroform is more poisonous to the cilia than ether, but in the form of vapour as used for anæsthesia neither has any effect on ciliary movement. Dr. HILL does not himself suggest any clinical applications, but his observations, added to those of earlier investigators, make it certain that the ciliated cells of the tracheal and bronchial mucous membranes, by their powerful rhythmical movements, do transport bronchial and pulmonary secretion, mixed with foreign matter such as dust particles, up to the rima glottidis whence it is either swallowed or expelled as sputum. Ciliary movement is clearly the primary agent in the process of expectoration, to which the muscular mechanism of respiration gives merely an approbatory fiat.

This factor of ciliary action is of more than academic interest. For if the conception of expectoration is restricted to the muscular mechanism of respiration, cough comes to be regarded as an explosive expiratory act depending on the presence of excessive secretion in the bronchial and alveolar trees. Whereas if the ciliary function is properly regarded, cough associated with sputum becomes for the most part an ill-controlled and unnecessary act, only really necessary when the cilia have been destroyed by inflammation or by trauma. Even in bronchiectasis, where large quantities of purulent sputum have to be expectorated, the act of coughing may be largely eliminated by making use of the force of gravity as in postural drainage. But the cough reflex is not necessarily associated with the presence of pulmonary secretion and subsequent expectoration. It is true that coughing may be initiated by irritation of the mucous membrane of the larger bronchi by such stimuli as irritating gases, cold air, and excessive secretion. In bronchiectasis coughing is only aroused when the contents of the cavities are brought into contact with the mucous membrane of the larger bronchi either by overflow or by a sudden change in position. With this exception the cough reflex originates, strange as it may seem, in the majority of cases in extra-pulmonary situations such as the larynx, the pharynx and naso-pharynx, the mediastinal glands, the stomach, or the ear. To realise this one has only to recall the classical types of cough such as the stomach cough, the ear cough, and the throat cough, all types of reflex vagal stimulation; the pleuritic cough; the gander or brassy cough which is heard when the recurrent laryngeal nerve is involved in aortic aneurysm or in new growth of the mediastinal glands. Again the cough in pertussis bears a striking resemblance to that heard in children suffering from mediastinal enlargement. Clinical and radiological evidence alike suggest that the exciting cause of the cough is the same in both cases—namely, glandular enlargement producing reflex vagal irritation. Experience with lipiodol fails to disclose any cough reflex in the smaller bronchi and it seems that this chiefly comes into play when the secretion reaches the larger bronchi, the trachea, the larynx, and especially the pharyngeal wall. If the cilia are intact and their movement unimpaired, the act of coughing may be unnecessary and even harmful.

The best illustration of this thesis is to be found in a well-regulated sanatorium where the chorus of coughing is far less than that which greets the ear in railway carriages, restaurants, theatres, and churches. But relatively much more sputum is expectorated in sanatoriums than in public places. Patients who are taught to control their cough or to cough only at certain specified times soon become aware that sputum may be expectorated at the proper time with at the most a gentle "clearing of the throat," and that explosive coughing is not necessary. One of the important tasks which fall to the lot of the sanatorium physician is to teach the patients under his care to avoid useless coughing with its harmful increase in pulmonary movement and its grave risk of introducing infection into the sound lung. In other words, the physician has to teach the patient to recondition the cough reflex, and to allow the cilia to do the work which they are constructed to perform—i.e., to remove all harmful matter from the alveolar and bronchial tracts. The morning cough, prolonged to the point of vomiting, almost universal in patients suffering from pulmonary complaints and frequent in

inveterate smokers with no pulmonary lesion, is due to a collection of viscid mucus on the posterior pharyngeal wall. This tenacious secretion has been brought up overnight by ciliary action from the bronchial tree or has been excreted from the chronically inflamed mucous membrane of the pharynx. In either case the effect is the same—namely, to stimulate the cough reflex and sometimes the vomiting reflex. This cough can therefore best be relieved by a warm alkaline drink designed to render the mucus less viscid and to clear the pharyngeal wall. Dr. HILL's work itself suggests some clinical applications. If ciliary action is more rapid in the horizontal position than in the vertical the process of expectoration without cough should be accelerated by recumbency, provided, of course, that no other factors such as cardiac lesions preclude this posture. If ciliary action is accelerated by stretching the mucous membrane of the trachea and bronchi, extension of the head and neck might assist the expectatory process. In any case it would be worth while to test the effect of physical agents and drugs, locally applied or internally administered, on the rate of ciliary movement in the human bronchial tree.

THE FOUR PLAGUES OF EGYPT.

FEW persons not directly concerned realise the difficulty and importance of the Egyptian problem. It came to birth with the opening of the Suez Canal, when the growing Empire found an imperfectly organised population across its vital trade-route. It reached a baleful adolescence in the days of the Dual Control and the occupation, and at the time of GORDON's death it filled the English horizon. The genius of CROMER, MILNER, and KITCHENER kept it within bounds until 1914, but while the Empire was at war the Egyptian problem grew apace. The time for repressive measures had passed, and the remedy was tried of giving the country the utmost possible degree of autonomy. But against peace along these lines is the necessity of maintaining sufficient force in the background to protect the Canal and the European interests in Egypt if anarchy should command the situation. Politically the Nile Valley remains a flood that may burst its banks at any moment, and there are only flimsy barriers in the way of its disruptive power.

The peculiar bitterness of the Egyptian populace as a whole against Europe is due to the fact that while her Western neighbours have attained to a real civilisation, Egypt has never since the great days of the Pharaohs achieved more than a shadow. The apparent modernity of Egyptian institutions is a cloak held by various Western interests over one of the most ignorant and downtrodden peoples in the world. If the country were left to itself its railways, hotels, and most of its commerce would disappear in a few years. There are probably many reasons for this failure to become civilised, but none can be more important than that advanced by Dr. J. B. CHRISTOPHERSON in his presidential address delivered on Nov. 1st to the Section of Tropical Diseases and Parasitology of the Royal Society of Medicine. It is impossible to have a sound mind in an unsound body, and Egypt is physically rotten. The foreigners and educated classes together, says Dr. CHRISTOPHERSON, do not number more than half a million, and the vitalising element of the country is the fellahin, the agricultural population of 14 millions. This huge class is practically illiterate, is ground down in the mud of its cultivations by tyranny great and small, and is ravaged by the four plagues of bilharzia, hookworm, pellagra, and ophthalmia. Dr. CHRISTOPHERSON might have added to this list diabetes and sexual perversion, both of which are widespread. Bilharzia and hookworm are traceable directly to the river and the soil from which the race springs; pellagra is presumably a food-deficiency disease, and the ophthalmic infections are spread by flies which breed in the dirt of the villages. Probably 75 per cent. of the nation suffer from bilharzia, and the four plagues together account, in Dr. CHRISTOPHERSON's opinion, for one-third of all the deaths. These afflictions impose on their hosts a hopeless mental and moral handicap; they undermine self-confidence and manhood and make their victim ineducable and uncivilisable. The proof of this is in the incredible change that comes over the fellah who is cured of them. Dr. CHRISTOPHERSON describes the ordinary untreated peasant as a man of good physique with a somewhat hang-dog expression, a pale, sallow, muddy complexion, not over-clean or tidy, cruel, unreliable, impulsive, fanatical, and easily influenced to criminal acts. He has no ambition, and his habits are those of 2000 or 10,000 years ago. The "nafr" in the Egyptian Army, who is nowadays kept free from his endemic diseases, is a fine worker, capable of steadiness and devotion, possessed of a very keen sense of humour and an original talent for impromptu acting. The Church Missionary Society recognise that no amount of educative effort is of any use until these diseases are eradicated, and at their hospital in Old Cairo 13,167 persons were cured during 1926 and 1927. The possibilities of a hookworm campaign are reviewed on p. 992 of our present issue.

Dr. CHRISTOPHERSON's conclusion, that Egypt's need is not so much for law or for the material benefits of civilisation, as for physicians to cure her four plagues, will be endorsed by everyone with practical experience of the country. They are for her the root of all evil. If the fellah had a healthy body he would be educable; if he were educated he could be civilised and politically enfranchised as nowadays, whatever the appearance of things may be, he certainly is not. If he were civilised he could be left in charge of his own country without the constant suspicious supervision that seems indispensable to-day and is so irksome and humiliating to those Egyptians who wish to fulfil their obligations to the West. Truly, he who will cure the four plagues may have of Egypt anything he wishes.

POST-OPERATIVE THROMBOSIS.

Post-operative thrombosis is at best a nuisance and at worst a serious and dangerous sequel to surgical operations and childbirth. Its underlying cause or causes and the precise mechanism by which it is produced have never been satisfactorily explained; all that has been fairly certain is that it is more likely to occur in older than in younger people and after extensive rather than slight operations, and especially in those involving the abdomen. Behind all the statistics of its incidence is the difficulty that small clots may occur without any symptoms at all and as, once started, a thrombus propagates itself, its size and destiny are to some extent accidental; hence the occurrence of white legs or pulmonary emboli may not be a very satisfactory guide to the conditions underlying post-operative thrombosis in general. Recent work[1] in Prof. E. E. GLYNN's laboratory in Liverpool, begun by Dr. W. HOWEL EVANS and

[1] Jour. Path., Bact., 1928, xxxi., 833.

carried on with Dr. F. EARLAM and Dr. R. Y. DAWBARN, seems to throw a good deal of light on its immediate mechanism and holds out some prospect that its basal cause may be soon discovered and something done to prevent it. That blood platelets have an intimate relation with clotting has been shown in a variety of ways; W. CRAMER, for example, found that filtered plasma would not clot, L. ASCHOFF and others have observed that an accumulation of platelets was anatomically the basis from which an intravitam thrombus grows, and J. TAIT has recently pointed out that threads of fibrin may actually be seen to form along the tracks of particles emanating from platelets. The Liverpool workers show from the examination of a number of normal and diseased persons that clotting time, as measured outside the body, varies inversely with the number of platelets counted in the circulating blood; diminution of platelets is even more plainly associated with failure of the clot to retract. Frequent counts on 50 surgical cases revealed the new fact that after operations the number of platelets in the blood begins to rise about the fourth day, increases to a maximum about the tenth day, and thereafter falls slowly back to the normal level. It can hardly be a coincidence that clinical thrombosis and embolism most frequently appear about the tenth day after operation. The extent of the rise varies widely; in one case it was absent and in a good many quite small. In the greatest increase the platelets were two and a half times as abundant as they were before operation; on the average they increased by about 50 per cent. Analysis of the individual cases shows that the more substantial rises occurred after the larger operations, but apart from this, no connexion with any particular operation is obvious, nor does the age of the patient seem to be important. Much the same was found in 28 cases of childbirth; six showed no significant platelet rise, but the average increase was to 240 per cent. of the prelabour level and the largest to 470 per cent. The combination of operation and delivery in five cases of Cæsarean section gave even more marked increases. Control observations show that the platelets are not influenced by stopping in bed, by anæsthesia, or by simple hæmorrhage; with sepsis they may either fall or rise. These items of surgical operations being excluded, it is not a little suggestive to find that platelets also increase after fractures and during convalescence from lobar pneumonia. The feature which is common to these various circumstances is tissue injury, and if the suggestion that the absorption of breakdown products is the immediate stimulus is correct it remains to discover how it influences the platelets; possibly the normal activity of the spleen in destroying them is depressed. This interesting work includes at present no practical directions for avoiding post-operative thrombosis, though examination of the blood about the sixth day might show in which patients it was likely to develop, any count of 750,000 or thereby being a sign of danger. Lytic sera or some other agent which destroys platelets suggest themselves as possible remedies, but they might be dangerous, for platelets are particularly effective in promoting clotting when they disintegrate. Again, some means of stimulating the spleen to greater activity may be found, and it may be that the preventive effect which some surgeons attach to bodily exercises may be due as much to promoting the splenic circulation as to quickening the general blood flow. However, the matter will doubtless receive the further investigation which it deserves and the Liverpool observations certainly indicate a line along which prevention may be hopefully looked for.

Annotations.

"Ne quid nimis."

THE LORD MAYOR'S SHOW.

THE programme of the Civic Procession which is to pass through the streets of London to-day, Friday, contains welcome evidence of the growth of public interest in health and social welfare. Industry as represented by the City Guilds has long been a prominent feature of the Lord Mayor's Show, but the wider aspects of public hygiene have never before been presented on this scale. The National Milk Publicity Council is sending a car, drawn by a team of four Suffolk Punches, representing milk as a health promoter. An immense milk bottle in an appropriate setting is surrounded by children dressed to represent the food fairies in the milk. Two cars are arranged and shown by the Industrial Welfare Society, which encourages the study of questions affecting the welfare of workers engaged in industry, and assists and advises employers on starting and improving schemes for the welfare of their employees. The Health and Cleanliness Council in its exhibit contrasts the clean and the dirty home. Finally, the King Edward's Hospital Fund for London is represented by a car illustrating the progress made in the cure of disease and in the care and treatment of the sick, culminating in our great voluntary hospitals as we see them to-day. A mediæval apothecary is first shown at work in his laboratory. There follows a section of an up-to-date children's ward, with a child undergoing sunlight treatment. London is beginning to take its health conscience seriously.

LATE RESULTS OF OPERATIONS FOR GASTRO-DUODENAL ULCERATION.

AT this year's congress of the Association Française de Chirurgie there was a brisk discussion[1] on the late results of surgical treatment of ulcers of the stomach and duodenum, and it is interesting to compare the opinions there expressed with those held by authorities in this country. In reviewing his experience of so-called radical resection methods and indirect methods, which include gastro-enterostomy, gastro-duodenostomy, and enervation of the stomach, Mr. J. Okinczye pointed out that from time to time we must reconsider whether a peptic ulcer is to be regarded as a local condition or as the expression of a general disease. Is it logical to speak of gastric resection as radical treatment? He believes that surgery can only claim to palliate the local manifestations of the disease, and that no operation at present executed can be selected either for its intention or its results to the exclusion of all others. Most of them seem to be rewarded with a certain measure of success, and the conditions of failure are veiled in obscurity. Possibly the results depend in some way upon the state of evolution of the disease at the time of intervention; symptoms seem to follow a cycle, and operations towards the end of this cycle might well prove more successful than at other times. Too little, however, is known of the factors influencing the course of the disease to enable us to choose the most propitious moment for surgery, and Okinczye's conclusion is that the most important indication for operating is the failure of relief from medical treatment pursued for a reasonable time. The seat of predilection for ulcer, he suggests, seems to be the pyloric antrum, but sometimes a functional disturbance of this area pushes the disease (as it were) into the duodenum, or, after gastro-jejunostomy, perhaps into the jejunum. Should this view be accepted duodenal ulcer must be looked on in the light of a complication of a trouble which has its centre primarily in the stomach. If so, it is

[1] See Presse Méd., Oct., 1928.

rational to attack the stomach in seeking to cure the duodenal lesion, and in fact Okinczye reports 78 per cent. of good late results from resection operations compared with 66 per cent. for gastro-jejunostomy. A mortality of 13·6 per cent., however, was associated with the former. At the same meeting Mr. X. Delore, of Lyons, declared that gastro-jejunostomy is a very satisfactory method of treatment for duodenal ulcer, giving 70 to 80 per cent. of good late results. But gastro-duodenectomy, he considers, is followed by a higher percentage of permanent cures. In 62 cases of duodenal ulcer 28 gastro-duodenectomies (45 per cent.) were performed with one death, whilst gastro-jejunostomy was performed in the rest. Thus, while he regards gastro-duodenectomy as the method of choice there remains a large field for gastro-jejunostomy, the results of which are improved if the duodenal ulcer is excised or cauterised locally. On all these questions there is little unanimity, as is illustrated by the interesting experience of Prof. Henri Hartmann.[2] Surgeons in this country are almost all agreed that for an ulcer of the lesser curvature gastro-jejunostomy is not very suitable, yet Prof. Hartmann is strongly in favour of such an operation, when it is of the posterior type and the anastomotic opening abuts on the greater curvature of the antrum. The mortality, he says, is about one half that of gastric resection, and this very largely compensates for the fact that resection gives better immediate results.

[2] Chirurgie de l'Estomac. Paris: Masson et Cie. 1928.

PIRATE SURGEONS.

ON Nov. 7th, before the Historical Section of the Royal Society of Medicine, an address on Pirate Surgeons was given by Dr. Philip Gosse, who is well known as the greatest, or possibly only, living authority on the exciting topic of piracy. He opened his remarks by explaining that the title chosen had apparently caused some misapprehension in certain quarters, and he earnestly reassured his hearers that he had no intention of mentioning the names of any living persons. His remarks were concerned with the medical men who, in the seventeenth and eighteenth centuries, sailed with the buccaneers and pirates to stitch up their wounds and trim their beards. He included the buccaneers, although these were not, strictly speaking, pirates, but the distinction was often so slight that it seemed unnecessary to differentiate between them. Actually the buccaneer who was British, French, or Dutch, practised his adventurous craft in the Spanish-American seas, and preyed upon Spaniards only. The pirate proper, on the contrary, took a wider view of his profession, and in his own words "waged war upon the whole world," irrespective of nation or kinship. One of the chief of the pirate surgeons was Captain Thomas Dover, an amazing character who remains immortalised by the diaphoretic powder attributed to him; he sailed the seas, if not as a pirate captain, as a very open-minded privateer, and was the author of a medical "best-seller" entitled "The Ancient Physician's Legacy to His Country," in which he claimed that almost every ill to which the human body was subject could be cured by copious draughts of metallic mercury. He also sacked Guayaquil in Peru, cured 172 sailors of plague, and rescued Alexander Selkirk: and yet, in spite of all this, so distinguished a Member of the Royal College of Physicians failed to achieve the honour of becoming a Fellow. Amongst the less well-known surgeons was Lionel Wafer, who also wrote a book, describing his hardships and adventures crossing the Isthmus of Panama in 1681 with some other mutinous buccaneers. Wafer got left behind in the jungle and was captured by a none-too-friendly chief, but owing to his skill in bleeding one of the chief's wives he became the inseparable companion of the delighted potentate. Alexander Exquemeling, the Flemish barber-surgeon, was the author of a remarkable work, "The History of the Buccaneers of America," 1684, which gives a lucid but accurate account of the doings of those extraordinary "brothers of the coast." Dr. Gosse then spoke of some of the lesser lights, such as Dr. Bullock, who took part in the plundering of a Spanish-American town, but becoming drunk, was left behind in the retreat to the ships, to be captured and afterwards to become a popular practitioner of medicine and "civilly entertained especially by the women" in the same town. Then there was Richard Jobson, who tired of the dull routine of a druggist's assistant in London, and ran away to sea to become a buccaneer, which he combined with the study of divinity, carrying always with him "a Greek testament which he frequently read and would translate extempore into English to such of the company as were disposed to hear him." A less lovable pirate was Dr. Peter Scudamore, surgeon to Captain Bartholomew Roberts, of the *Royal Fortune*. He did many things unbecoming to one of his learned profession, as stealing the surgical instruments belonging to a brother surgeon, and, what gave even greater offence, a backgammon board from a fellow pirate. He could talk the Angolan tongue, and was caught red-handed attempting to foment a mutiny amongst a hold-full of stolen slaves. At last the gallows claimed him, when he died penitent but unregretted, at a wholesale hanging of pirates at Cape Coast Castle in 1722.

As the lecturer pointed out, the glimpses of the adventures of the surgeon aboard a pirate vessel were all too brief, and it was only occasionally that the veil was lifted for a moment to show us something of the lives of these obscure practitioners of surgery.

BORNA DISEASE.

AT a time when a great deal of attention is being paid to acute infections of the central nervous system in man, more than usual interest attaches to the publication by the Medical Research Council of a special report[1] on a form of encephalomyelitis in sheep and cattle, which goes by the name of Borna disease. The condition is fortunately still unknown in the British Isles, so that the studies here presented have no immediate application in this country; but every addition to our knowledge of the viruses which attack the nervous system and of the changes to which they give rise in the brain and spinal cord is valuable at present.

The investigations here described were made by Mr. S. Nicolau and Mr. I. A. Galloway, working as guests at the National Institute of Medical Research at Hampstead. The disease concerned has been known, under several names, for more than a century as an enzoötic and epizoötic affection of horses, cattle, and sheep, and during the last few years various workers have shown that it is attributable to a filter-passing virus, and that pathologically its most distinctive feature is the presence in the ganglion cells of the hippocampal gyrus of certain "inclusions," referred to as Joest-Degen bodies. The transmission of the disease under natural conditions is probably by the respiratory tract or by ingestion. From the experiments now recorded and from earlier work it appears that the virus of Borna disease has properties common to the viruses of vaccinia, herpes, rabies, and poliomyelitis—the "neurotropic ectodermoses" of Levaditi. Under favourable conditions it passes through bacteria-proof filters, and through collodion ultra-filters which permit the passage of colloidal particles of large dimensions; after centrifugalisation for 15 minutes at 5400 revolutions per minute the supernatant fluid remains infective; it is resistant to the action of glycerine, but is sensitive to desiccation, ultra-violet light and heat, and is destroyed by ether, chloroform, and formalin, and it has not been propagated in vitro. Rabbits can be infected experimentally with the virus by intracerebral or intrathecal

[1] Borna Disease and Enzoötic Encephalo-myelitis of Sheep and Cattle. By S. Nicolau, D.Sc., and I. A. Galloway, B.Sc., M.R.C.V.S., Medical Research Council. Special Report Series No. 121. London: H.M. Stationery Office, 1928. Pp. 90. 5s.

inoculation, by inoculation into a peripheral nerve (sciatic), or into the anterior chamber of the eye, and also—in animals whose brain or meninges have been irritated by normal saline or serum—by application of virulent material to the scarified skin. The presence of the virus in the brain, spinal cord, peripheral nerves, parotid, and adrenal glands of rabbits dead of the disease has been demonstrated by the injection of portions of these organs into the brains of other rabbits. Monkeys have been inoculated intracerebrally and have developed encephalomyelitis after a very long incubation period (33–71 days); and in one animal the symptoms resembled those of poliomyelitis. Pathologically Borna disease resembles poliomyelitis, herpes encephalitis, and human epidemic encephalitis in the infiltrative character of the lesions. In the experimental rabbits perivascular and parenchymatous infiltration by mononuclear cells was found throughout the central nervous system, and there was also an interstitial infiltration in the peripheral nerves and very intense inflammatory changes in the dorsal root ganglia. Satellitism and neuronophagia of the ganglion cells were widespread if not very intense. In the monkey the findings were similar, but the incidence was less upon the spinal cord; the characteristic intracellular Joest-Degen bodies were found in many parts of the brain. A solid immunity against Borna disease can occasionally be obtained in the rabbit by inoculating suitably attenuated virus into the brain, and immunity has also been produced by multiple intravenous injections, by corneal scarification, and by intratesticular inoculation with fresh virulent material.

The viruses which attack the central nervous system may be divided into two groups according to the type of pathological change to which they give rise. On the one hand, there are those which excite considerable infiltrative interstitial reaction, such as the viruses of poliomyelitis, encephalitis lethargica, herpes, and rabies; on the other, there are those which cause perivascular demyelinisation with little infiltrative reaction, the best known being that associated with vaccination. The virus of Borna disease is now placed in the former group, and this work of Nicolau and Galloway has widened our knowledge of the group as a whole. One fact which they have proved is that when virus is inoculated into the brain it may spread not only throughout the central nervous system but also into the peripheral nerves; this is probably a general rule for viruses of this group. These same workers have shown that it is true in the rabbit for the viruses of rabies and herpes, and in man it is known that poliomyelitis may give rise to infiltrative lesions in the peripheral nerves and dorsal root ganglia, though the actual presence of infective material in these situations has not, to our knowledge, been demonstrated. In the particular case of Borna disease the virus, spreading peripherally, strikes severely at the posterior root ganglia, and there is an argument by analogy that herpes in man may also be a central infection spreading peripherally and producing its most intense effects on the posterior root ganglia, the central parts of the nervous system having greater powers of defence against it.

THE SEMON LECTURE.

THE evolution of laryngo-rhinology has followed a course which might have been predicted. On looking backwards it is easy to realise the errors into which it has fallen and the dangers to which it has been exposed, and as all special branches of medicine are in their infancy exposed to similar dangers, the progress of this one may serve as a guide and an example to younger specialties. After sporadic and uncertain attempts by various pioneers extending over a century, Manuel Garcia in 1854 was the first to obtain a satisfactory view of the interior of the larynx and, by presenting a paper on the subject to the Royal Society of London, became the founder of laryngology. Czermak, of Pesth, and Türck, of Vienna, developed the method, and the latter city became, and has ever since remained, a great centre for the study and teaching of the allied sciences of laryngology and rhinology. Last week Prof. Markusz Hajek, of Vienna, came to London to deliver the Semon lecture and received an enthusiastic welcome from his old pupils and from his numerous friends and admirers in this country. He took as the subject of his lecture Laryngo-Rhinology and General Medicine, and he pointed out, with a wealth of illustration drawn from his long experience, the pitfalls which have beset the path of his specialty. At first the new discovery was followed by a rapid improvement in technique and by the invention of numerous instruments of examination and treatment, and the result was a tendency for laryngology and rhinology to become divorced from general medicine. An instance of this was the indiscriminate local treatment of tuberculous laryngitis which followed in some quarters the pioneer work of Heryng and Krause in this field. This phase has now happily passed, and all laryngologists agree that the most important part of the treatment is that of the general affection, and that local treatment of tuberculous laryngitis should only be carried out in close coöperation with the physician. The danger now, he thinks, comes rather from the opposite direction, and is that clinical diagnosis may be pushed into the background by laboratory methods. There is a tendency to rely too greatly on all kinds of examinations, histological, bacteriological, and serological, and a consequent danger that the clinical acumen of the experienced practitioner may not be given the full scope formerly accorded to it. These laboratory methods are of great value and importance, but they also are subject to fallacy, and the clinician should be guided but not ruled by them.

GAS ATTACK ON RATS.

RAT week is a suitable time to refer to recent work on the use of cyanogen compounds for destroying these troublesome rodents. An investigation[1] has been made at the New York Quarantine Station by Surgeons C. V. Akin and G. C. Sherrard, in order to determine the relative efficiency of these products from the standpoints of (1) lethal efficiency, (2) safety to fumigators and to others, and (3) cost. Cyanogen compounds are dangerous things to handle, and not long ago the Prefect of the Seine forbad[2] the use of hydrocyanic acid for the destruction of vermin in houses, where the use of selective poisons or of virus is the method of choice. But ships are not houses, and they are in many ways specially adapted for treatment by fumigation. Moreover, the destruction of rats in ships is even more important than in houses, since rats entering ships from plague-infested ports may introduce this disease into other ports.

The New York investigators studied the action of liquid hydrocyanic acid (about 98 per cent. HCN), both alone and containing 20 per cent. of cyanogen chloride (tear gas) added to serve as an indicator, to the fumigator or other humans entering the treated space, of the presence of residual traces of gas. They also worked with the gas generated from sodium cyanide in situ by the addition of mineral acid, also using a mixture of sodium cyanide and chlorate to yield, when acidified with hydrochloric acid, hydrocyanic acid with a small proportion of tear gas. Further they tried a German preparation, Zyklon-B, of hydrocyanic acid adsorbed on "diatomite"—a silicious material similar to keiselguhr—and made pungent by the addition of chloropicrin, as well as a preparation of calcium cyanide containing free hydrocyanic acid ($CaCy_2$, 2HCN), which yields its hydrocyanic acid on exposure to moist air and carbonic acid. The solid products are sold in air-tight cans or pails, and as they, especially the calcium cyanide, are finely divided, care must be exercised in

[1] Public Health Reports, vol. xliii., No. 41, Oct. 12th, 1928. Comparative Efficiency of Cyanogen Products used in Fumigation.
[2] See THE LANCET, 1928, i., 1340.

distribution so that the residual material left after fumigation can all be removed from the ship's hold or other compartment. Spreading in thin layers on paper is recommended. It was found that rats, which were all of one breed, varied considerably in their resistance to the poison, and no opinion could be offered as to the relative susceptibility of these rats and wild rats. They were usually placed in cages at both floor and ceiling level in the test-rooms in which a standard dosage of 2 oz. of HCN per 1000 cubic feet was used as a rule. Diffusion of the gas was found to be slow, which, having regard to the small difference between its density and that of air, is not surprising. Also, as the gas is slightly lighter than air, the rats at ceiling level succumbed sooner than those on the floor. The authors say: "It is a well-known fact that rats escape cyanide fumigation as fumigation is usually done, and the reason for this becomes clear when it is seen that a lethal quantity of the gas will not flow through small openings into tightly closed sections not primarily exposed to the gas. The practical proof of this was witnessed on shipboard when test animals, concealed in the covered bilges, closed drawers, and similarly tight compartments, were unaffected by standard amounts of cyanide during the course of a two-hour fumigation." The importance of careful preparation of a ship before fumigation is therefore obvious.

Experiments showed that the residues of the solid preparations, more especially from calcium cyanide, should be removed with great care to avoid danger. A concentration of one-tenth of an ounce of hydrocyanic acid in 1000 cubic feet of air, in the opinion of the authors, "must be considered as dangerous to human beings exposed over a long period of time, and they also suggest that rats which are well enough protected in living quarters to escape a dose of 1 oz. of HCN per 1000 cubic feet will also survive a two-hour exposure to the standard dose." The lethal efficiency of liquid acid is much greater than that of gas generated from cyanide in situ and still more so than that of calcium cyanide. Zyklon-B is very effective —obviously it is in effect liquid acid. The conclusion was forced on the authors that less than the theoretical amount of gas was evolved into the air from sodium cyanide by the agency of mineral acids. A wise note of warning is struck in respect of the absorption of hydrocyanic acid by bedding, mats, rugs, &c., which are not dry and which are best removed before operations commence. Conversely the protective effect of layers of damp sacking or similar materials on rats hiding under them should be considered, as it is very great. "If managed with due care and proper respect," the investigation concludes, "hydrocyanic acid is the best of all fumigants for rodents. Careless use of it will be attended with human fatalities, but it will kill rats under conditions that the use of sulphur cannot meet; and it is obvious that if fumigation does not kill rats, time and money are wasted." Incidentally, it kills those minor horrors of life at sea—cockroaches, bugs, and the like. At well-equipped fumigating stations with a highly-trained personnel liquid acid will be found the best agent to use. For smaller ones Zyklon-B has advantage. The liquid acid is not a very safe substance to convey on account of some tendency to undergo violent decomposition, and should not be sent by common carrier. The lessons learned in the course of the experimental work covered in this report point insistently to one conclusion: *Fumigate fewer ships better.*

DAWSON WILLIAMS MEMORIAL PRIZE.

AT the general meeting of subscribers to the Dawson Williams Memorial Fund, held on July 10th last under the chairmanship of Sir Humphry Rolleston, it was resolved that the sum subscribed to this memorial should be devoted to a prize in pædiatrics, to be awarded every two years or at longer intervals, and that the scope of the prize and the details of its adjudication should be left to the discretion of the trustees, with the assistance of such other persons as they might wish to consult. The following have agreed to act ex officio as trustees: the Presidents (for the time being) of the Royal College of Physicians of London, the Royal College of Surgeons of England, the British Medical Association, the Royal Society of Medicine, the Section for the Study of Disease in Children (R.S.M.), and the Editor of the *British Medical Journal*. The Medical Secretary of the British Medical Association acts as convener and secretary of the trusteeship, and the first meeting of the trustees was held at the House of the Association on Oct. 19th, with Sir John Rose Bradford, P.R.C.P., in the chair. It was decided to ask the Charity Commissioners to accept for investment the sum of £849 now in hand, to receive all interest accruing therefrom, and to pay this over to the trust account at the bank for the purposes of the Fund. In pursuance of the resolutions of the meeting on July 10th it was resolved that the Dawson Williams Memorial Prize should take the form of an award for the best work done in pædiatrics during the five years immediately preceding the date of the award; that any registered medical practitioner in the British Empire should be eligible for the award; and that the first award, to be made by the trustees in July, 1930, should consist of a cheque for 50 guineas.

PAY BEDS IN LONDON HOSPITALS.

FIVE years ago [1] we published a list of 13 general hospitals in London which provided accommodation for patients of moderate means. It contained the names of three hospitals with medical schools attached, providing between them 108 pay beds, and ten other hospitals, mostly general, with resident medical officers, providing between them 213 pay beds. In the report of the special committee on pay beds of King Edward's Hospital Fund for London, published in July, 1928, the first of these two groups contained the names of six hospitals, providing 164 beds, and the second the names of 22 hospitals, providing 358 beds. It is true that the area surveyed by the special committee was much wider than that covered by our own inquiries, which made no claim to be exhaustive, but even so the increase that has taken place in hospital accommodation for paying patients during the last five years is significant. It has a bearing on a doubt, expressed by the special committee referred to above, as to whether the nature and extent of the existing pay-bed accommodation at voluntary hospitals is generally known by members of the middle and professional classes. The committee suggested that King Edward's Hospital Fund might well consider the wisdom of preparing and publishing year by year, for the information of the public, a list of the pay beds at the London voluntary hospitals, with rates of charge and other particulars. We are informed that the management committee of the Fund are at present considering this recommendation and would be glad to know whether a list such as is included in the appendix of the report of the special committee, if prepared and issued annually, would be likely to be of use to the public and the medical profession throughout the country. It seems to us clear that it is of the utmost importance for practitioners to be kept up to date with developments of this kind, and we would urge the Fund to proceed with arrangements for the annual issue of such a list. The appendix to the report includes also particulars of 22 general, cottage, and other hospitals without resident medical officers who admit paying patients, 8 hospitals for women, and 24 other special hospitals. As further evidence of the importance of an annual supplement to the information here provided is the information that of the teaching hospitals not hitherto providing pay beds the Middlesex, St. Bartholomew's and St. Mary's have schemes for establishing such beds, while St. Thomas's, the Royal Free, King's College, and Westminster Hospitals propose to add considerably to the number of private wards at present available. Many other extensions of this sort to general and special hospitals are contemplated, and

[1] THE LANCET, 1923, ii., 1000.

it seems certain that an annual list will be not only of great practical use but will be a valuable index of the trend of hospital administration in London.

A GREAT PHARMACIST.

PHARMACY has suffered a heavy loss by the death in his sixty-third year of Mr. Edmund White, which occurred at his home at Putney on Nov. 3rd. It is no exaggeration to say that Mr. White was the greatest pharmacist of his day and generation. There have been pharmacists with a wider range of scientific knowledge than he possessed and pharmacists with a larger place in the sphere of business, but it is doubtful if there has been in our time another pharmacist in whom the learning of the schools and the wisdom of the market-place were so happily blended. Possessing this valuable combination he gave his services to the craft in which he was reared, although he must have been tempted at times to utilise his qualities in fields where the prizes are more plentiful and the work less exacting. To-day it is by no means uncommon for a pharmacist to graduate in science at one of the universities, but in the days when White took the degree of Bachelor of Science it was an unusual if not a novel achievement for one of his calling. Before that, he had obtained during his apprenticeship days the Bell Scholarship which entitled him to a free course of instruction in the Society's School of Pharmacy, an institution which has been foster-mother to many men who have since gained distinction in other vocations. At the completion of his courses he obtained the Pereira medal, the most coveted prize offered to pharmaceutical students, and after that he stayed for a time at the school working as a demonstrator. From there he went to St. Thomas's Hospital as chief pharmacist, where he remained for a long period, acting at the same time as one of the Pharmaceutical Society's examiners. He was elected a member of the Council some years before the outbreak of war and held the office of President during the war years. His services to his country during that exacting period were of great value; his position as head of a venerable organisation equipped with resources for research work and even, at a crisis, for carrying out manufacturing processes enabled him to throw himself and the Society with him into the work of producing some of the drugs and chemical reagents, for our supplies of which we had until then depended upon continental sources. Those who were associated with him in those days will recall the eagerness with which he set to work on this important task. Too old for service in the field, he fought the good fight in the arena for which he was so admirably accoutred. We are told that on the very day war was declared he spoke with his colleagues very strongly of the desirability of voiding enemy patents, and although we cannot go so far as to say that it was he who suggested the policy eventually adopted by the Government in this matter, it is clear that he was one of its earliest advocates. The importance of Mr. White's life work vis-à-vis the medical profession lay in his constant advocacy of higher and higher education for pharmacists. He was of the school which believes that pharmacy is the handmaid of medicine and that the true rôle of the pharmacist is to study the science of drugs. It was his view, and he persisted in it in the teeth of the most obstinate opposition from the commercial school, that the pharmacist's proper function could not be performed unless he had a good educational foundation, and unless on that groundwork there was erected a specialised structure of a much more enduring nature than that which passed muster a few years ago. He succeeded in convincing his colleagues to that end, and the pharmaceutical student to-day will find it very difficult to obtain registration as a pharmacist unless he works hard and systematically. The day of "cramming" for the qualifying examination has gone; for this the thanks of the medical profession are due to Edmund White more than to any other man. A closing word should be said concerning his views on the production of the British Pharmacopœia; he held that if the pharmacist was more highly educated he should be more highly esteemed both by the medical profession and the public. That is to say, he stood out, to use a colloquialism, for due recognition for the pharmacist whether he was in his shop or helping to revise the Pharmacopœia. As a corollary, if pharmacists through their Society gave valuable assistance to the General Medical Council in the work of producing the Pharmacopœia, that work should be recognised in a more conspicuous way than had been customary in the past. Edmund White was the Pharmaceutical Society's representative on the Commission for the Production of the British Pharmacopœia, and no better one could have been chosen.

GENERAL MEDICAL COUNCIL ELECTION.

THE result of the voting for two Direct Representatives for England to be members of the General Council of Medical Education and Registration in the place of the late Dr. J. A. Macdonald and of Sir Robert Bolam, who has been appointed to represent the University of Durham, is as follows:—

Ernest Kaye Le Fleming, M.R.C.S.	11,455
John Wardle Bone, M.B.	11,340
Gordon Reginald Ward, M.R.C.S.	4,262
Edward Andrew Gregg, L.R.C.P.	3,108

The constituency numbered 32,758 (as compared with 29,179 at the 1924 election), of whom 15,082 (last time 15,229) took part. The proportion of those taking no part was thus rather more than one-half of the possible voters, suggesting that interest in the election was notably less than four years ago. The number of invalid votes received was 720. Only 368 voting papers, or 1·12 per cent. of the whole number, were returned as dead letters. An effort will be made by the Registrar of the Council to get into touch with all practitioners whose papers have been returned in this way before their names are erased from the Register under Section 14 of the Medical Act, 1858.

The next session of the Council will commence at 2 P.M. on Nov. 27th, when the President, Sir Donald MacAlister, will take the chair and give an address.

Sir Wilfred Grenfell, F.R.C.S., of Labrador, has been elected Lord Rector of the University of St. Andrews.

THE Secretary of State for Scotland has appointed Dr. John Parlane Kinloch, medical officer of health of Aberdeen and head of the Public Health Department of Aberdeen University, to be Chief Medical Officer in the Department of Health for Scotland which on Jan. 1st will take over the powers and duties of the Scottish Board of Health.

THE Council of the British Institute of Radiology incorporated with the Rontgen Society has decided to hold a special meeting at the opening of the new session on lines similar to the meeting last year, when the new body was inaugurated. The date has been fixed for Thursday and Friday, Nov. 15th and 16th, and besides the presidential address by Mr. G. W. C. Kaye, D.Sc., papers have been promised by Prof. W. L. Bragg, F.R.S., Sir Thomas Horder, Mr. W. Sampson Handley, Mr. A. J. Walton, Mr. G. Shearer, D.Sc., and others whose work is connected with radiology. Most of the meetings will be held at the Central Hall, Westminster, and there will be an exhibition of X ray and allied apparatus which is said to include exhibits by all the British firms engaged in this industry. The proceedings will not be open to the general public, but anyone who is practically interested in radiological work is invited to attend. The Director of the Institute, Dr. J. Muir, 32, Welbeck-street, London, W. 1, will be pleased to give any information desired. The Mackenzie Davidson Memorial Lecture will be delivered by Prof. Bragg, at 8.15 on Nov. 14th, at the house of the Royal Society of Medicine, 1, Wimpole-street, W. The subject is X Ray Optics.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

X.—THE INTERPRETATION OF THE BLOOD COUNT.

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Part II.*—The White Cells.

In this country the term leucocyte is usually regarded as embracing all the varieties of white cells; in America there is a tendency to confine the use of the term to polymorphonuclear cells. To avoid confusion it is safer to use the term "white cells" to cover all classes, reserving the term leucocyte for special application.

The White Cell Count.

Knowledge of the total number of white cells per c.mm. of the blood is of the utmost importance in the diagnosis of a number of conditions, but it is of very little use unless the relative percentages of the various classes of cells is also known. The total and differential counts will therefore be considered together.

There is no fixed normal figure for the total number of white cell in the circulating blood. Their numbers are subject to physiological variations depending upon exercise, upon the stage of digestion, and even fluctuate throughout the day without apparent reference to any particular cause. Variations of 1000 or more per c.mm. in the same patient on different days need then excite no surprise. The following table must therefore be regarded only as a rough guide to the limits of variation in the normal person.

White Cells of a Normal Person.

Total No.		5500 to 8500 per c.mm.
Polymorphs	Neutrophile	60 to 75 per cent.
	Eosinophile	0 to 2 per cent.
	Basophile	0 to 1 per cent.
Mononuclear	Lymphocytes	25 to 40 per cent.
	Monocytes	2 to 7 per cent.

In normal healthy adults the white count will usually be found to lie somewhere between 5500 and 8500 per c.mm. Figures above or below these, however, need not be regarded as necessarily abnormal. A decrease is spoken of as a *leucopenia*, an increase as a *leucocytosis* or *lymphocytosis* according to the type of cell involved. Before going into the question of variations in the total numbers it is necessary to consider the types of cells.

Types of White Cells.

Normally five classes of white cells are found in the blood. These fall into two divisions, those with lobed nuclei and those without. The first are spoken of as polymorphonuclear, the latter as mononuclear cells.

In the *polymorphonuclear* order, the cells, according to the nature of the granules in the cytoplasm, are again divided into *neutrophile*, *eosinophile*, and *basophiles*. Of these three classes the neutrophiles are by far the most common, forming from 60 to 75 per cent. of all the white cells. Eosinophiles and basophiles may be so scanty as not to be found in an ordinary examination; the former are seldom present to an extent of more than 2 and the latter of more than 0·5 per cent.

The most important and plentiful of the *mononuclear* order are the *lymphocytes*; the remaining order of this class is constituted by that type of cell variously known as the endothelial, large mononuclear, or transitional cell, and also by many other names. The name *monocyte* is coming into general use for this cell, and it is to be hoped that in course of time it will replace all others. Lymphocytes are further divided by those who like doing this sort of thing into large and small, but the distinction appears to be without importance. Lymphocytes normally occur as from about 25 to 40 per cent. of the white cells; the monocytes seldom exceed 7 per cent.

Embryonic Forms.—Certain other cells of types usually confined to the bone-marrow or elsewhere in the hæmatopoietic system may also occur in the blood stream under abnormal circumstances. The most important of these are the embryonic forms of the cells ordinarily occurring in the blood. The young forms of the polymorphonuclear order of cells are known as *myelocytes* and *myeloblasts*. In these cells the nucleus has not yet acquired its adult lobed condition, but is mononuclear. Myelocytes show granules in their cytoplasm and can thus be divided into the same three classes as the polymorphonuclear cells; myeloblasts, being younger and less differentiated, have not yet acquired the cytoplasmic granulation.

The embryonic forms of the lymphocytes are known as *prolymphocytes* or *lymphoidocytes*. They have unlobed nuclei and clear cytoplasm, and are thus very difficult of differentiation from large lymphocytes or even from myelocytes. Finally, megakaryocytes normally only present in the bone-marrow, may occasionally appear in the blood stream.

Changes in Number and Proportion of White Cells.

In the interpretation of the white count by far the most important points for consideration are the total number of white cells, their relative proportions, and the presence or absence of embryonic forms. It is impossible to dissociate the consideration of these three factors from each other.

Roughly speaking, it may be said that the lymphocytes are much less liable to numerical fluctuations than the polymorphs. As the factors governing variation in the monocytes are little understood, it therefore follows that in the consideration of the differential count the relative proportions of the polymorph and mononuclear orders of cells is of prime importance.

Leucopenia.—A decrease in the total white count (*leucopenia*) is always associated with a decrease of the polymorphs. The mononuclear cells usually remain at about their normal level, but on account of the decrease of polymorphs are relatively increased. Such a diminution of the polymorphs with relative increase of the lymphocytes is characteristic of conditions in which the activity of the bone-marrow is depressed and may reach a high degree in aplastic anæmia; it is a characteristic feature of Banti's disease and may be present to some degree also in primary anæmia. The leucopenia of typhoid fever is an early and constant diagnostic sign; it may be present also in measles, influenza, and tuberculosis, but less constantly, and therefore of correspondingly less diagnostic value.

Leucocytosis.—An increase in the total number of white cells usually depends upon an increase in the polymorphs, but there are exceptions to this rule. Where the white cells are increased over 10,000 per c.mm., and where the polymorphs make up over 80 per cent. of the total, the condition may properly be spoken of as a leucocytosis. When, however, the lymphocytes are increased so as to make up 40 per cent. or more of the white cells, the state of affairs is usually referred to as a lymphocytosis.

Leucocytosis is characteristic of infections due to the "pyogenic cocci," and to all infections associated with the production of pus, except renal tuberculosis. Within certain limits the degree of leucocytosis is proportional to the severity of the infection and to

* Part I. on the Red Cells appeared last week.

the capacity for response on the part of the patient; thus, in pneumonia, a high degree of leucocytosis is a hopeful prognostic sign. A white count of 40,000 per c.mm. indicates a very vigorous response; figures above this up to even 100,000 per c.mm. or over are met with from time to time but are rare.

A leucocytosis, together with pyrexia, practically always indicates the presence of a "septic" condition. The one important exception is lymphadenoma or Hodgkin's disease; the ætiology of this condition is unknown, and it is possible that actually it is an infective condition; in any case it is not infrequently associated with a considerable leucocytosis and a high but irregular temperature. In the absence of physical signs pointing to some such infective condition as pneumonia or meningitis, the presence of a leucocytosis serves as an indication for a thorough and unremitting search for some area of local inflammation or pus formation. The presence of a leucocytosis with some degree of pyrexia may serve to point to the presence of active septic inflammation in cases not doing well after operation. A rising leucocyte count, with marked increase in the percentage of polymorphs, should rouse suspicion of the presence of pus.

Although a leucocytosis is usually indicative of the activity of an infection, it is important to remember that it may occur in certain toxic states and also as the result of the action of some poisons. Of the former, cirrhosis and acute yellow atrophy of the liver are the commonest examples; of the latter, carbon monoxide and the salicylates, colchicine and quinine in large doses are those most likely to be met with in practice. Certain substances, such as nucleic acid and cinnamate of sodium are, of course, injected parenterally for the purpose of producing a leucocytosis; in the presence of an acute infection they are not usually successful in so doing, nor is there any reliable evidence that such leucocytosis as may be produced in this way has any therapeutic value.

Hæmorrhage may produce a moderate degree of leucocytosis; after a single hæmorrhage this disappears in three or four days, but if the hæmorrhages persist the leucocytosis will persist likewise.

Lymphocytosis, as explained above, may be absolute or relative. Absolute lymphocytosis—that is, an actual increase in the total number of lymphocytes—is rare, except in the case of lymphatic leukæmia, which will be referred to later. It occurs in whooping-cough and in small-pox, but the best example is afforded by that rare condition, glandular fever or acute infective mononucleosis. In this condition the white count may rise to 30,000 or 40,000 cells per c.mm., of which 80 to 90 per cent. may be lymphocytes; in the face of such a blood-picture the differential diagnosis from lymphatic leukæmia may be difficult; a valuable diagnostic point is that this latter condition is always associated with a high degree of anæmia, while in glandular fever anæmia is usually absent or only slight. Relative lymphocytosis is always associated with a leucopenia and has already been referred to.

Variations in the percentages of the classes of white cells normally found in the blood other than the neutrophile polymorphs and lymphocytes may sometimes give assistance in confirming a diagnosis, but their importance is usually not great.

Eosinophilia, or an increase in the percentage of the eosinophile polymorphs, is associated with many protozoal infestations. Perhaps the commonest of these is echinococcal or hydatid infection. The presence of an eosinophilia may assist in confirming a diagnosis of this condition, but its absence must never be taken as negativing it; the same applies to trichiniasis, filariasis, and to the presence of intestinal worms. The increase of the eosinophiles in true spasmodic asthma may sometimes help to confirm the diagnosis where the history is poorly given and no attack has been observed. Eosinophilia is the rule in pemphigus and dermatitis herpetiformis, but does not usually greatly assist the diagnosis. An eosinophilia, together with a neutrophile leucocytosis, occurs in a good many cases of lymphadenoma, but this condition has no constant blood-picture and can only be certainly diagnosed by the examination of an excised gland.

Basophilia, or an increase of the basophile polymorphs, is rare and has no diagnostic significance.

The *monocytes* are said to be increased in chronic malaria. Inasmuch as one pathologist's monocyte or transitional cell may be another's large lymphocyte little importance should be attached to variations in the percentage of these cells.

Megakaryocytes properly belong in the bone-marrow and only appear in the blood when it is subjected to great stress of activity. They may figure in the blood-films in primary anæmia and in cases of pneumonia with a high degree of leucocytosis. Their appearance has no diagnostic or prognostic significance. Under similar circumstances of red marrow activity, and particularly in children, occasional embryonic forms of the white cells may also appear in the blood stream. Their presence in large numbers, however, is indicative of an entirely unrestrained and abnormal activity on the part of the hæmatopoietic system, and on it depends the diagnosis of leukæmia.

The Leukæmias.—There are two types of leukæmia dependent upon the involvement of those portions of the hæmatopoietic system concerned respectively with the formation of cells of the polymorphonuclear and of the lymphocytic order. In the former cases the condition is spoken of as myeloid, myelogenous, or medullary; in the latter as lymphatic leukæmia. Mixed types have been described, but it is highly improbable that they ever occur; a lymphoidocytic leukæmia is also sometimes described, but it is probable that all such cases are examples either of a lymphatic or of a myeloid leukæmia, in which the majority of the cells are myeloblasts.

In the vast majority of cases of leukæmia one or other of the classes of white cells will be found to be enormously increased, the percentage of the other class being relatively diminished, but the numbers remaining actually normal. Thus the total white cell count in a case of myeloid leukæmia may be 100,000, of which the polymorphonuclears, myelocytes, and myeloblasts may make up 98 per cent., leaving only 2 per cent. of lymphocytes. In spite of this great relative diminution the actual number of the lymphocytes remains normal at about 2000 per c.mm.

In describing the blood-picture in a case of myeloid leukæmia the pathologist will usually specify the percentages of the different types of normal and embryonic cells present. In some cases, where the majority of the embryonic cells are of the myeloblastic type, the pathologist may be in doubt as to whether he is dealing with myeloblasts or prolymphocytes. The cytoplasm of the former cells contains granules demonstrable by special peroxidase stains, and to be sure with which type he is dealing, the pathologist may feel obliged to apply one of these stains. The presence of oxidase granules in the cytoplasm definitely classes the cells as myeloblasts and places the leukæmia in the myeloid category. Failure to apply this technique probably accounts for some of the anomalous cases showing the apparent blood-picture of lymphatic with the clinical signs of myeloid leukæmia.

It is important to bear in mind that a mere increase in the number of the white cells does not entail a diagnosis of leukæmia. As pointed out above, in a simple leucocytosis the cells may occasionally attain 100,000 per c.mm., and cases of 200,000 per c.mm. have been reported. Nor does the presence of an occasional embryonic form justify this diagnosis. To establish the diagnosis, embryonic cells must be present in considerable numbers; this is almost more important than the presence of a high total count, for cases of leukæmia with only a moderate increase of the white cells have been recorded.

There is a tendency to think that the more embryonic the type of cell present the more virulent

and deadly must be the leukæmic condition. On the assumption that large lymphocytes are younger than small ones, some hæmatologists regard the occurrence of cells of large size in lymphatic leukæmia and the preponderance of myeloblasts in myeloid leukæmia as indicating the likelihood of any early fatal termination. Clinical findings do not appear to support this view.

Special Articles.

MEDICINE AND THE LAW.

Cross-examination under Anæsthetic.

Lord Lee's Royal Commission would be startled by the procedure at a police investigation in Hawaii last September, when a suspected person, who had steadfastly protested his innocence, was injected with hyoscine by a police surgeon in the endeavour to elicit information from him while under the influence of the drug. The case was one of murder. An American school-boy was abducted from his school on some pretext by a man somewhat vaguely described as an "oriental." According to reports in the local newspapers which have just reached this country, the boy's father received a letter demanding a ransom of 10,000 dollars for his son; he attended at the appointed place and paid the money. The police, although they had apparently been notified, failed to appear at the meeting; later the body of the murdered boy was found in some bushes. Suspicion fell on a 20-year-old Japanese who had been chauffeur in the boy's family. The chauffeur, whose name was Kaisan, was arrested and was examined by what in England would probably be labelled "third degree" methods. He steadily maintained his innocence and his ignorance of the murder even though he was pressed with questions by expert examiners, one of whom, according to the newspaper report, "has obtained more confessions from criminals than any other man in Honolulu." Among the test imposed upon him was a direction to copy the original letter in which the ransom was demanded. As the English law-courts well know, the conclusions of a handwriting expert are occasionally fallacious. Two experts, however, were apparently satisfied that Kaisan's handwriting was identical with that of the original letter. Of the two experts—one a bank clerk, the other Dr. Stanley D. Porteus, professor of psychology in the University of Hawaii—the latter seems subsequently to have changed his mind; thus at this stage little had been done to connect Kaisan with the crime, and, in the words of the newspaper report, "Kaisan, after being quizzed constantly for 12 hours, was returned to a cell and again questioned there by Deputy City Attorney Brooks without result." In this dilemma, we are told, the police surgeon administered "a heavy injection of hyoscine hydrobromide" to Kaisan. "The drug produces a twilight sleep from which persons emerge to talk from their subconscious mind and to reveal truths that they had secreted during full consciousness. Under the effects of this drug Kaisan confessed to the writing of the ransom letter, describing in detail the process." But when the effect of the drug wore off, Kaisan repudiated any confession and steadily asserted his innocence. A few hours later a second injection was administered with entirely negative results. At this stage the real murderer was discovered elsewhere, confessed to the crime, and was dealt with; it thus became unnecessary to exhaust the resources of medicine in the attempt to extract a confession from Kaisan.

Six years ago Dr. E. House, of Ferris, Texas, read a paper [1] before the State Medical Association of Texas on the Use of Scopolamine in Criminology. Experience obtained in obstetrical practice might, he suggested, be turned to account in the detection of crime. He was even able to describe two tests made upon alleged criminals. In both cases, he said, his subjects, while under the influence of the drug, gave answers which, when corroborated, proved their innocence. The drug, by depressing the power of reasoning or imagination, elicited nothing but truthful answers. Why, asked Dr. House, should this method not be available in criminology? The bloodhound's trail may lead to the suspect's door, but corroborative evidence is indispensable before conviction; similarly, all data secured by the use of scopolamine would equally require corroboration.

In this country the answer would be that we have evolved a procedure under which statements made by accused persons to the police are not normally admissible in evidence unless the accused person has first been cautioned in a formula of words adopted on the advice of experienced judges. We cannot therefore accept a method which would negative that caution and which would trick a suspect and catch him off his guard. It would be instinctively repulsive alike to judge, counsel, and jury, apart even from the fact that English courts of law are conservatively distrustful of scientific discovery in its application to criminal investigation. To dope a man into confession would be as distasteful as to extract evidence by torture.

Successful Defence of Post-epileptic Automatism.

In a murder trial at Lancaster Assizes on Oct. 30th evidence was given by mental specialists which suggested that the accused had killed his wife while in a condition of post-epileptic automatism. The evidence indicated that the man armed himself with a revolver and cartridges and sought out his wife, who was living apart from him. He fired three shots at her and as she was being taken helpless into a neighbour's house he fired a fourth shot into her back at point blank range. He was then disarmed by the driver and conductor of a passing motor-omnibus, to whom he remarked "I have done it this time." He was asked to go to the police station, but declined, and said he would wait for the police. Later he said to a constable: "There is nothing to be afraid of; I have done it, and am ready to take my punishment; the only thing I am sorry about is my little daughter." The evidence of witnesses was that his manner was calm and deliberate and that he appeared to know perfectly well what he was doing. The accused in the witness-box gave various details of his history. As a young man he had been struck on the left ear with the prong of a hay-fork while haymaking. He had wandered away from home from time to time and had not known where he had been. He joined the army in 1897, had Mediterranean fever at Gibraltar, and malaria and sunstroke in India. He rejoined in the Great War, was blown up by a shell, suffered from shell-shock, and was eventually discharged. Major O. D. Jarvis, R.A.M.C., gave evidence of the finding of a medical board in 1922 that the accused was suffering from petit mal; there was, he said, a condition of post-epileptic automatism in which a man might do things about which he seemed quite able to reason, though entirely unconscious of what he had done. Asked by Mr. Justice Humphreys if he knew of an instance of automatism occurring after an attack of minor, as distinguished from major, epilepsy, Major Jarvis replied that he could not recall an actual case at the moment, but that from his reading he was satisfied that automatism might occur even after minor epilepsy. In answer to a further question from the judge, the witness said the accused might make statements to the police in a state of automatism, though, if he afterwards made a statement referring to acts done in the automatic state, the fact would be against the theory of automatism. Dr. Alastair Robertson Grant, deputy medical superintendent at the Whittingham Mental Hospital, who had interviewed the accused and had seen his army medical history sheets, said that automatism was frequently associated with petit mal. Dr. Arthur Lowndes, of Longton, also gave evidence. The jury found that the accused was "guilty of the act charged but insane at the

[1] See THE LANCET, 1922, ii., 1082, 1190.

time." The case is interesting in that the learned judge, who has had special experience of the administration of the criminal law, put the defence of post-epileptic automatism to the jury in more sympathetic terms than are sometimes used in our courts.

New Dangerous Drugs Regulations.

The Home Office announces its intention to make fresh regulations under the Dangerous Drugs Act for the purpose of consolidating into one code the seven different sets of outstanding regulations, a proposal of great convenience which all will approve. It is also proposed to apply the existing provisions to certain drugs and preparations recently brought within Part III. of the Act of 1920—namely, extract and tincture of Indian hemp, dihydro-oxycodeinone, dihydrocodeinone, and preparations containing them, and preparations containing less than one-tenth per cent. of diacetylmorphine. An announcement regarding these was noted lately when the 1925 Act was brought into force. It is further proposed that the new regulations shall provide for constituting a tribunal to which cases may be referred when there is reason to think that a dentist may be contravening the Dangerous Drugs Regulations. The constitution of such a tribunal for medical practitioners was one of the recommendations of the Departmental Committee on Morphine and Heroin Addiction. It was a valued concession of self-government to the medical profession and a wise recognition of the existence of adequate alternatives to proceedings in the police-court; its extension to the profession of dentistry will be an indication that the system has been found satisfactory.

INTERNATIONAL CONFERENCE ON HEAT AND LIGHT IN MEDICINE, SURGERY, AND PUBLIC HEALTH.

THE congress was addressed on the second [1] day of the proceedings by Dr. C. B. Heald, who read a paper on the development of new electrotherapeutic apparatus. Dr. Heald spoke of apparatus now in use at the Royal Free Hospital, among other appliances mentioned being a new rhythmic myotrope and a tunnel for infra-red light baths. Dr. F. Nagelschmidt spoke on foam-treatment, a new method of applying external heat. By adding a small quantity of non-toxic non-absorbable saponin solution to water of any desired temperature and blowing a current of air through the mixture a fine foam is produced. The foam contains little moisture and is very stable. The patient is laid in a bath containing a few inches of water of the desired temperature. Saponin solution is added, air blown through, and the patient is covered with the foam. Local treatments also can be given. Dr. Nagelschmidt described another application of foam treatment; oxygen is blown through the solution and a fine foam is produced which is less stable than air-foam. It has remarkable cleansing properties when brought into contact with mucous membranes and is very suitable for vaginal and urethral irrigations, intranasal treatment, and so forth. Saponin, although not itself absorbed, is said to facilitate the absorption of other substances, and is a suitable medium for dissolving drugs for local medications.

Dr. C. Conyers Morrell contributed a paper on plant pigments in relation to photosensitisation, embodying much of his original work in this field. The importance of sensitisation by plant pigments, its common occurrence, and the part played by it in animal metabolism is now recognised, and Dr. Morrell's paper will encourage further work in this direction.

On the third day of the conference Dr. F. Talbot read a paper on actinotherapy and dental caries. Dr. Talbot considers vitamin D to play a part in the arrest as well as in the prevention of dental caries. The part it plays in the development of healthy teeth is already established. Comparing the teeth of the children in a home, one year after the installation of a carbon-arc lamp, with their teeth in the three years previous to irradiation, he observed distinct improvement; there was less caries, arrest of caries in some cases, and healthier gums. He considers that general treatment, not local irradiation, is of value, and that probably irradiation is of greater value than cod-liver oil in these cases.

Dr. A. J. Cemach, of Vienna, spoke on ultra-violet therapy in oto-rhino-laryngology. Dr. Cemach treats lupus of the larynx by direct irradiation with the quartz mercury-vapour lamp. He introduces a small water-cooled burner into the mouth and guides it with the finger past the epiglottis. Constitutional treatment, tuberculin, and general light treatment in suitable cases are given concurrently. In early cases a cure may be expected, in more advanced ones sometimes a cure and always relief of pain. Extensive lung involvement is not considered by him to be a contra-indication to this method of treatment.

Sir Henry Gauvain showed cinematograph films of life at Alton and Hayling, which illustrated the part played by heliotherapy in the treatment of surgical tuberculosis. Films illustrating artificial light treatment were also shown. Sir Henry Gauvain stressed the fact that light treatment is only one of the factors in the treatment of surgical tuberculosis and should never be regarded as the only factor.

Dr. M. Weinbren spoke on ultra-violet radiation in the treatment of chronic pulmonary tuberculosis. He agreed with Rollier that cachexia and toxæmia are the main contra-indications to radiation in phthisis, and to the treatment of any other condition by light. He did not find it necessary to adhere to Rollier's method of exposure, but gave full baths with suberythema doses from the start. He found that in some cases, even among out-patients, there was evidence of improvement as shown by weight, X ray appearance, and general condition, and deduced that light treatment given cautiously to selected cases could prove of value even when it was given under the worst possible conditions for success—to hospital out-patients.

On the last day of the conference Dr. Albert Eidinow read a paper on photosensitisation. Sensitisation with eosine previous to light treatment gave deeper reactions and increased desquamation. Intravenous injections had now been abandoned in favour of local injections (into the lesion) in the treatment of lupus. Painting the skin with eosin was useless and merely cut off the light before it penetrated to the living cells.

Mr. T. C. Angus read a paper on the efficiency of ultra-violet light apparatus, with regard to the emission of light of given wave-length and current consumption. Dr. L. Hill, who presided, referred to the importance of the phenomenon of photosensitisation, which permitted the longer and more deeply penetrating rays of the spectrum to be used. He could not accept statements which had recently been made that rays of short wave-lengths penetrated much deeper into the skin than had previously been estimated. A paper by an American investigator, Dr. M. J. Dorcas, of Cleveland, U.S.A., on energy distribution of various types of arc lamps was read in the author's absence, and his slides showing energy curves were demonstrated.

The Lessons of the Congress.

It was apparent from the contributions to the congress that the principles on which actinotherapy is based are beginning to emerge as an exact science, but that its application and limitations in treatment are far from being yet clearly defined. There can no longer be any doubt that actinotherapy will occupy a definite and probably an important place in therapeutics, but there is much need of further critical investigation. Even on such fundamental questions as the extent of the range of physiologically

[1] A report of the proceedings on the first day appeared in the annotation columns last week (p. 934).

active rays there is little information and no agreement. The advantages of whole-body over localised irradiation, apart from cases in which irradiation is used to produce intense inflammatory reactions, must depend to some extent on the size of the area irradiated and on the amount of skin which must normally be irradiated to obtain a minimum or optimum general effect. On this point also we have only very scanty information. There is still no accepted unit of dosage. While the physiological action of the various regions of the spectrum is still so little known it would be unwise to attempt to express dosage by a physical formula, and with the apparatus at present in use it would be impracticable to attempt treatment using a narrow portion of the spectrum only. But it is clear that until the dosage is defined no fair comparison of results obtained by different observers can be made.

The Exhibition.

At the Medical Exhibition held in connexion with the conference, the leading firms manufacturing ultra-violet light apparatus were represented. Comparing this year's with last year's exhibits, it was noteworthy that the prices of apparatus were on the whole considerably lower, and also that the smaller and less luxurious types of stand were favoured. There were not many new models, but some of the burners have been improved, and elimination of the heating coil in the atmospheric type of burner (K.B.B.) is an improvement. A stand with improved vertical and horizontal movement is exhibited by the Medical Supply Association. High-frequency electrodes (Gallois), exhibited by Messrs. Kelvin, Bottomley and Baird, are said to combine ultra-violet radiation, capable of producing erythema with high-frequency treatment. Vita-glass Manufacturing Board exhibited samples of Vita-glass showing improved glazing and greater transparency.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

THE BUCKSTON BROWNE TRUST.

THE dinner at the Royal College of Surgeons on Nov. 1st was the first of a series of feasts made possible by the generosity of Mr. G. Buckston Browne, F.R.C.S., who gave a sum of £5000, the interest from which should afford an annual opportunity for social intercourse between Fellows and Members of the College. By the terms of the trust at least half of the invited guests must be Members of the College, and in the following account Members are indicated by an asterisk (*).

The guests were received in the Hall of the College by the President, Sir Berkeley Moynihan, and the Vice-Presidents, Prof. Hey Groves and Mr. Warren Low, and dinner was served in the Library, the quality of the menu being indicated by the fact that Messrs. Ring and Brymer were the providers. On the right of the President sat Lord Dawson of Penn,* Sir George Newman, Sir Anthony Bowlby, Major Leonard Darwin (sole surviving son of Charles Darwin), Sir William Bragg (Director of the Royal Institution), Sir Richard Luce, M.P., Mr. C. H. Fagge (c), Dr. E. Collingwood Andrews,* Mr. R. P. Rowlands (c), Dr. Graham Little,* M.P., Sir Edward Pollock (the next-to-Senior Fellow), Mr. W. Sampson Handley (c), and Dr. Astley V. Clarke* (Leicester). On the left of the President sat Sir Thomas Barlow,* Sir Alfred Hopkinson, K.C., Sir Thomas Holland (Rector of the Imperial College of Science), Sir John Rose Bradford,* P.R.C.P., Lieut.-Colonel F. E. Fremantle, M.P., Sir Alfred Rice-Oxley,* Mr. F. J. Steward (c), Dr. Charles Edwards* (Andover), Lieut.-Colonel C. T. Samman,* Sir William Lister, Dr. A. Owen Lankester,* and Dr. Arthur H. Bostock* (Chichester). In addition to these there were also present other Members (c) of the Council of the College as follow: Sir Holburt Waring, Sir Cuthbert Wallace, Mr. J. Herbert Fisher, Prof. G. E. Gask, Mr. W. McAdam Eccles, Sir Charles Gordon-Watson, Mr. Victor Bonney, Mr. Hugh Lett, Mr. Leonard P. Gamgee, and Mr. R. G. Hogarth, and the following Fellows and Members: Sir Arthur Keith (Conservator), Mr. G. Buckston Browne, Mr. C. A. Griffiths (Cardiff), Mr. J. A. Hayward, Mr. H. W. Armstead, Sir John H. Parsons, Mr. J. F. Dobson (Leeds), Mr. W. H. B. Brook (Lincoln), Mr. T. H. Openshaw, Mr. Thomas H. Bickerton (Liverpool), Mr. Henry Colgate (Eastbourne), Mr. Raymond Johnson, Sir George Thane, Mr. Macleod Yearsley, Mr. J. F. Jennings, Mr. E. F. White (Crowborough), Dr. T. Wilson Parry,* Dr. H. Bellamy Gardner,* Dr. G. de Bec Turtle,* Dr. E. Le F. Payne* (Kew), Dr. Guy Wood* (Charterhouse), Dr. Rickard W. Lloyd,* Dr. E. M. Callender,* Dr. Frank Savery,* Dr. L. Haden Guest,* Dr. Ernest Ware,* Dr. Maurice Newfield,* Dr. P. Sidney Spokes,* Dr. George Parker* (Bristol), Dr. E. G. Moon* (Broadstairs), Dr. H. B. Brackenbury* (Chairman of Council, B.M.A.), Dr. Alan Randle,* Dr. T. W. Shore,* Prof. H. E. Roaf,* Prof. C. Lovatt Evans,* Dr. G. A. Buckmaster* (Bristol), Dr. C. W. Hutt,* Dr. P. H. Manson-Bahr,* Dr. W. H. W. Attlee* (Eton), Dr. J. O. Symes* (Clifton), Dr. Walter Broadbent* (Brighton), Dr. Harold H. B. MacLeod* (Shrewsbury), Dr. J. E. Kilvert* (Derby), Dr. G. Francis Smith* (Watford), Dr. Hugh Lawson* (Chislehurst), Dr. C. G. B. Kempe* (Salisbury), Dr. W. B. Maurice* (Marlborough), Dr. John Gay,* Dr. E. C. Morland,* Mr. D. J. G. Watkins* (Lincoln), Dr. Philip G. Laver* (Colchester), and Mr. W. H. Dolamore,* along with Dr. G. B. Hillman (Wakefield), Mr. Philip H. Coxe, Mr. H. M. Hake (Director of the National Portrait Gallery), Mr. O. J. R. Howarth (Secretary of the British Association), Mr. S. Forrest Cowell (Secretary, R.C.S.), Mr. R. H. Burne (Physiological Curator), and Mr. D. K. Cassels (Assistant Secretary).

Sir Berkeley Moynihan proposed the toasts of The King and The Donor, remarking that there would then and in the future be no other toasts than these on the annual occasion, and, of course, no reply to them. He alluded to Mr. Buckston Browne's gift of Downe House to the British Association and said that some of the Darwin treasures were on view in the Conservator's room. He then bade the guests mingle, an Anglo-Saxon word which with its implications of frequency and intimacy aptly described the pleasant social intercourse which followed.

RECENT WORK ON HOOKWORM.

SOME SIGNIFICANT RESULTS.

WE lately commented in a leading article [1] upon an investigation by Clayton Lane into the diagnosis of hookworm infection. Twelve years ago he took up the position that there were so many infected persons—he estimated them at about 800 millions—that they could not receive individual diagnosis before treatment unless two conditions were fulfilled. The first of these was that diagnostic methods must be far advanced from the position they then held, and the interval has seen the evolution of his diagnostic technique of direct centrifugal floatation (D.C.F.), which is simple, cheap, and certain if a single female hookworm is normally ovipositing, and which is capable of mass usage at the rate of a quarter of a million specimens yearly for every two microscopists employed. Second, the procedure employed in hookworm campaigns of taking the laboratory to the stool must be replaced by the material-to-laboratory method used in every other branch of clinical pathology. This second requirement has been rendered possible for D.C.F. by two simple expedients; the stool must be kept under water and its temperature must not exceed 80° to 86° F., except for relatively short periods, whose extent and duration he did not

[1] THE LANCET, July 21st, p. 128.

determine. These conditions being observed equally good diagnostic results can be got with a stool weeks old as with a fresh one. A fundamental point needs emphasis. Clayton Lane's final conclusions are based on egg counts made, not by the method which he used uncontrolled in 1917 when he initiated egg counts as an essential part of a hookworm investigation, nor by the equally uncontrolled method of N. R. Stoll, for both these have emerged unsatisfactorily from controlled counts. He has used a modification of D.C.F. which careful controls of wide range have shown to be more accurate than any other at present available, and which other conditions have suggested as being near to accuracy.

The first large-scale hookworm campaign, using the stools-to-laboratory method, was Clayton Lane's in 1915–17. He used for the examination of over 33,000 persons about Darjeeling the crude diagnostic methods then available. A second instance of this procedure has now been reported by A. C. Chandler, using D.C.F. and sampling, by means of about 10,000 examinations, various areas over nearly the whole of India, with its population of more than 300 millions. All the examinations were made in the laboratory of the School of Tropical Medicine, Calcutta, to which samples were posted. In one detail Chandler altered the advised procedure. Instead of being submerged the fæcal specimens were packed to the brim in tins and, because he noticed in his examinations normal-looking eggs only, Chandler concluded without using controls that there was no loss of eggs between collection and examination; he attributed this lack of development to the exclusion of oxygen. P. A. Maplestone, however, using the same tins in the same laboratory, has reported that a flange prevents complete descent of the lid, so that an air space about 2 mm. deep overlies the fæces in a filled tin, and his controlled counts show that in the first six days the number of the eggs in these filled tins is halved, those remaining being commonly embryonated, and free larvæ being occasionally seen. He found, too, that this development occurred in the superficial layers, and whether or not the fæcal surface was deprived of contact with air. These counts, as he notes, were subject to the ever-present error inherent in Stoll's method. During postal transmission of such fæces gases of decomposition are apt to force off the lid with oozing of fæces, and, as Maplestone shows, escape of larvæ which must be expected sometimes to reach infectivity—a dirty, dangerous state of affairs which postal authorities are sure to forbid. Clayton Lane's original investigation had, however, shown that submersion in thymolised water appeared to meet this difficulty, so that it is likely to be used in other campaigns unless some better means of preventing gaseous fermentation is discovered.

Chandler's stool-to-laboratory survey constitutes a notable achievement and an impressive demonstration of the practical possibility of this procedure. His work draws attention to another point, already established but persistently disregarded. By D. C. F. he obtained an infection-rate twice as great as did J. W. Tomb using Clayton Lane's earlier technique of levitation, the conditions being apparently the same; while in a Darjeeling tea garden in which district Lane's microscopists had obtained with a centrifuged smear an infection-rate varying from about 40 to 80 per cent. according to the garden concerned, D.C.F. showed one of 90 per cent. in spite of repeated intervening treatments. Statements in original papers, or even in abstracts issued under impressive authority, which do not define the technique employed in estimating a local infection, are inexactitudes parading deceitfully in a cloak of pseudo-scientific accuracy. They teem in the literature.

The Distribution of Species.

The interesting and important question of species distribution has received recent notice. Apart from Calcutta *Ancylostoma braziliense*, for which *A. ceylanicum* is a synonym, has apparently been found in man in India and Burmah when looked for. Its range, in animals at least, is world wide. *A. duodenale* appears to form a pure infection in Egypt, and F. L. Soper has reported a nearly similar condition in a Paraguay village. About the Darjeeling hills *Necator americanus* infection seems to be even purer than it is in most parts of America. Should the ethnological explanation of these differences not bear closer examination they form a pointer to some biological factor perhaps capable of preventive use by man.

The Rôle of Animals.

The influence on human hookworm infection of animals dependent on man is varied. The pig, as R. M. Gordon notes, furnished Maplestone with three specimens of *A. duodenale* and one worm which Gordon identified as *N. americanus*, but which exactly resembled specimens which Gordon obtained from pigs in Brazil. On morphological and biological grounds J. E. Ackert and Florence Payne in Trinidad separated the pig necator specifically as *N. suillus*. The morphological differences between this and *N. americanus* are of a minuteness equal to that which, according to the same observers, separates *N. americanus* as described by themselves from *N. americanus* as described by A. Looss. They should not be held specific in one case and not in the other. The biological tests were made with larvæ from untrapped cultures, and, as Clayton Lane has noted, these residual larvæ are perhaps those with least penetrative power, not average specimens, and that they did not produce infection may be explicable on those grounds. Of pigs examined in Trinidad 90 per cent. were infected with necator, and the pig must accordingly be held suspect as a "reservoir host" of this parasite and a disseminator of infection to man.

By eating and re-passing human fæces animals act as broadcasters of hookworm eggs. Chandler has obtained hookworm eggs from pig's fæces for three days after feeding the animal on egg-containing fæces. Cultures of the stool which first contained eggs after feeding produced many more larvæ than did cultures of the original stool; but again the cultures were untrapped, so that only the residual larvæ were counted. The lesson may be the opposite of that suggested. He finds that both dog and rat fill the same rôle. The influence of cattle lacks exact investigation, as does that of scarabæid beetles. Using cockroaches, he mentions an experiment in which 2 mg. of droppings from an insect fed on large numbers of hookworm eggs produced 110 larvæ, again, of course, from an untrapped culture, so that from the local numbers of these pests they must be active agents in producing a widespread soil infection in the Asansol Mines, Bengal. A good deal of incidental evidence is now accumulating as to animals forming unsuspecting baits for infective larvæ. After penetrating them larvæ shortly die and man is correspondingly safeguarded.

Light Infection.

Since Francis Bacon's time biology has rested on observation more or less controlled. For that proved procedure there is a tendency, particularly among non-medical writers on hookworm infection, to substitute a mathematical basis. An infection with a given number of hookworms is injurious, one with less is immaterial to the patient. C. W. Stiles has dealt with this "very definite, unambiguous, clinical advice based on definite unambiguous exact mathematical units," and he has emphasised, what after all every general practitioner could tell the hookworm worker, that men refuse in their reaction to disease to conform to mathematical formulæ, however impressive; so that, even if the lightest infections prove immaterial, there can be no exact mathematical group-limit between the material and immaterial ones. As for individuals, Clayton Lane has noted that tests employed must be both apt and exact. It leads nowhere to select a set of tests and, finding that they detect no difference between infected of a certain grade and non-infected, to state definitely that infections of that grade are immaterial. "It is as useless to attempt to measure entamœbæ with a foot rule,

whether obtained from Mr. Woolworth or from the Greenwich Observatory, as to record the hours of sunshine with the most delicate of barographs."[2] A set of tests established by Stiles 13 years ago did show a difference between the same community before and after treatment. They dealt with such matters as underlie material contentment—strength to earn, freedom and recovery from illness, length of life. They were confirmed by Clayton Lane in 1916 and after this interval are again being applied, but hitherto without the exact basis of accurate egg counts, made to determine the degree of infection present before disinfestation. Since these tests of energy, resistance, and recuperation have proved the most delicate hitherto employed, they or their like will doubtless be re-employed, checked by the exact diagnostic test now available, which alone can measure infections of that tenuity.

Unless the oviposition-rate of hookworms is fairly uniform, diagnosis in light infections cannot be certain. Mathematical aids have recently been called in to determine whether regular oviposition exists. H. W. Brown has pointed out that individual cyclical oviposition will produce a uniform tracing when worms are sufficiently numerous, provided, it may be commented, the cyclical condition is not due to change in environment acting equally on all worms. In the three cases he investigated the hookworms were estimated as numbering 13, 135, and 130. He laid considerable stress on figures derived from three-day and six-day running averages, that is, taking the last as an example, a comparison of the total eggs passed on days 1 to 6, with that on days 2 to 7, and so on through the whole series. But if individual, non-environmental cyclical oviposition do occur it will certainly be submerged in daily counts with 130 females laying, and it seems unreasonable not to conclude that it will be so even with 13; while with running averages of 3 to 6 days it must be wholly swamped. Here the mathematical aid invoked has proved illusory. Actually the presence or absence of cyclical oviposition can be determined only by daily counts from cases parasitised by a single female, and only D.C.F. is accurate enough to count these cases. Stoll's method used by Brown, even had it proved reliable within its limits, could not detect, much less count, an infection of this tenuity.

Migration of Larvæ.

Yet mathematics have a position in this biological problem. "Given ideal conditions of extra-corporeal development and of establishing contact with man, a single pair of hookworms is mathematically capable of destroying the human race within a year."[3] In other words, the degree of infection is of little hygienic importance, otherwise the tropics would be clear of man at this moment. It is the place and manner of defæcation, by the person with even a single pair of worms, which is significant. In our leading article already cited the proved migration of hookworm larvæ is mentioned, ease of progress determining its extent. The existence of migration has been denied on mathematical grounds, so few larvæ having been found at a distance from an infected spot. Yet mathematics show that if 10,000 larvæ reach a square inch of soil and thereupon space themselves uniformly on its surface one inch apart, they will cover a circle 4 ft. 8 in. in radius, so that the most perfect extraction will recover only one from each square inch of the soil within its circumference. If migration occur uniform recovery of such small numbers in uniform conditions would be evidence not of the restriction, but of the freedom of migration. But even if this free movement could occur all larvæ reaching the outer parts of the area would have traversed its inner portions, so that, whatever happens, the region about an infected spot must be the region of greatest risk. It follows that the more conscientious is the use of a latrine which does not prevent dejectional infection, the more generously does it infect. The importance of dejectional infection has been most strikingly proved by Cort, Grant, and Stoll in China. Of soil samples collected round latrines infective hookworm larvæ averaged about 11 per sample, while of those from ground where vegetables had been fertilised with infected night soil they averaged only about three.

Carbon Tetrachloride.

It requires hardihood to suggest that the popular carbon tetrachloride treatment is neither safe nor certain, but Clayton Lane has lately marshalled the deaths which have followed its use, and some evidence of its inefficacy may be discovered in important footnotes to a paper by R. W. Hill. Over 100 persons were treated first by this drug and then by oil of chenopodium, the dose of each being 3 c.cm. Apparently 25 per cent. remained infected when re-examined by H. H. Willis's uncertain method. Of the infected, Stoll's method missed 6, estimated 25 as containing fewer than 500 eggs per gramme of fæces, and in three more gave counts indicating residual infections varying between 25 and 800 worms, according as different estimates of their egg-laying power are accepted. In other words, after administration of two drugs, each in a dose which has caused a considerable number of deaths, there were, if trichostrongylus infection can be excluded, residual infections of this extent. Confirmatory evidence of the failure and risk of carbon tetrachloride lies in B. M. Wilson's statement,[4] that thymol had replaced it in Jamaica.

Carbon tetrachloride produces great fatty degeneration of the liver and sometimes of kidneys and adrenals. Administration is apparently a gamble on the occurrence of the usually rapid regeneration. It is the drug in present general use for the herd treatment of hookworm infection, that is for treatment on a mass scale without previous diagnosis, the procedure in such common use. Clayton Lane at Cardiff gave his studied reasons for the belief that with diagnosis so rapid and certain, the "persuasion" of backward races to accept herd treatment had no justification in mortality, science, or expediency, and that to use for it a drug which sometimes proved fatal in a smaller dose than that in habitual use for herd treatment was devoid alike of reason and humanity.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Health of the Free State.

THE report of the Department of Local Government and Public Health of the Irish Free State for the year ending March 31st, 1927, was issued a few days ago. It is remarked that the census of 1926 now gives a trustworthy basis for the calculation of local death-rates, and has been of much service to public health administration. The larger town districts in the year under review show a death-rate from all causes of 15·5 per 1000 of the population. There has been a gratifying improvement since the year 1916, when the town death-rate was 19·3 per 1000. Part of this improvement is attributed to the better housing conditions of the people to-day. Typhus is being gradually eliminated, and there has been a signal reduction in enteric fever. In every county, however, advance is hampered by financial considerations. The total number of attendances of out-patients at the treatment centres for venereal disease in Dublin was 26,598; in 1922–23 it was 22,230, and in 1925–26 it was 29,315.

The Local Appointments Act.

In the Dail last week President Cosgrave moved that a select committee of 11 deputies should be appointed to inquire and report whether, having

[2] Brit. Med. Jour., August 4th, p. 193.
[3] Ibid.
[4] Ibid., p. 207.

regard to the experience gained in the working of the Local Authorities (Officers and Employees) Act, 1926, any amendment of that Act was desirable. It will be remembered that by the Act the power of election of officers of local authorities was taken from those bodies and the choice of persons to be appointed to each position was entrusted to a Local Appointments Commission, which normally acts on the advice of a Selection Board. Many medical men welcomed this change, because it took the appointment to medical posts out of an atmosphere of political and family influence, if not because it was a step in the direction of a State-controlled service with entrance by competitive examination. As far as medical appointments are concerned the Act has worked without any cause for complaint, and there is no doubt that a better class of candidates is now attracted to the public service. If any change is made as the result of the inquiry by President Cosgrave's committee it is to be hoped that the change will be a step farther in the direction of central control, rather than of restoring power to the local bodies.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

The Local Government Reforms.

THE Secretary of State for Scotland and the Under Secretary have both been much occupied on the platform and with deputations for the last two months. The reception of the new local government proposals is critical and slow. The great health authorities are favourable, but the education authorities are largely antipathetic. Major Elliot made a good point in a speech reported as follows :—

"It was said that it meant an invasion of Scottish rights and an attack on Scottish local government. It seemed to him to bear in the opposite direction. The new county authorities and town councils controlling education and poor relief and all matters of local government would have a responsibility and power which were never possessed by local authorities in Scotland before. To unify the local authorities in Scotland and produce 30-odd great bodies was to produce bodies far more capable of standing up to the departments in Edinburgh or even to the Imperial Parliament than any local authority which they had ever seen in Scotland before."

In the process of devolution of administrative work, strong local authorities are a necessary counterpoise to the insistence of a central Government bureaucracy.

A Campaign for Health.

The Combe Trust has done many good things in the last two generations, and has now made possible a useful series of "talks" at the Edinburgh Y.M.C.A. lecture hall. The first was given by Dr. Chalmers Watson on The Doctor, the Individual, and the State. Dr. Watson always speaks with moderation and knowledge, and he was right in saying that "the development of a campaign for health would bring the numerous campaigns against disease—cancer, rheumatism, tuberculosis, heart disease, &c.—into a truer and wiser perspective." For these reasons he believed that the work of the recently constituted Scottish Health League merited the keen interest and support of the community.

The second talk of the series was given by Lieut.-Colonel J. du P. Langrishe, lecturer in Public Health in the University of Edinburgh, who took as his subject the Influence of Sunlight on Health.

I learn that a plan of campaign is being prepared for the Scottish Health League, the headquarters being the Usher Institute of Public Health. The new health museum that has grown up under Prof. Lebean's unresting energy is one of the best things to be seen in any Scottish medical school. It indicates a first-class conception of health object-teaching.

Sir Auckland Geddes on Education and Physique.

As Minister of National Service during the war, Sir Auckland Geddes has more knowledge than any other man of what the country suffered from defective physique, and he drove home the lesson in his address to the Philosophical Institution the other day when he spoke of education from the three standpoints—racial, physical, and mental. He would never forget, he said, the horror which struck him when he had to face the figures of the total men of military age in the country as contrasted with the total of men of military age who were fit. The difference—and he chose his word carefully—was appalling. He knew that a great deal had been done since, and was being done, but in many towns and villages and in the scattered cottages of the countryside, the physical side remained as hopelessly inefficient to-day as it was before the war. He declared—and the facts are only too true—that he could take his audience to cottage homes where the mental condition and health knowledge of mother and father were mediæval, where they dared not send for medical men to see their children, because they were already in debt to the local practitioner, and would not add to this indebtedness.

The address as a whole was an impressive plea for better adapted schools, for a high individual education, and above all for education in health and the production of personal fitness. It is gratifying to those who have given a life-time to these causes to hear a man of Geddes's force justifying our day's work from another standpoint.

Ultra-violet Light.

The Edinburgh child welfare centres are already well provided with lamps; but now the city has made a new departure: the Portobello Baths are fitted with appropriate lamps for all that wish to use them—on terms. The important fact is that the lamps are under skilled medical direction.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt. (D.) L. V. Donegan to *Virid* for R.N. Barracks, Devonport.

ROYAL NAVAL VOLUNTEER RESERVE

Proby. Surg. Sub.-Lt. H. L. Hoffman to be Surg. Sub.-Lt.

ROYAL ARMY MEDICAL CORPS.

Maj. J. T. Simson is re-empld. under Art. 507 (b), Royal Warrant for Pay and Promotion, 1926.

Lt. E. W. Hayward and Temp. Lt. J. E. Stokes resign their commns.

ARMY DENTAL CORPS.

Lt. D. W. N. Squires to be Capt.

ARMY RESERVE OF OFFICERS.

E. W. Hayward to be Lt.

TERRITORIAL ARMY.

Maj. J. K. Lund to be Lt.-Col. and to comd. the 125th (E. Lan.) Fd. Amb.

Maj. R. Coffey, having attained the age limit, retires and is granted the rank of Lt.-Col., with permission to wear the prescribed uniform.

Capt. L. A. Wilson, having attained the age limit, relinquishes his commn. and retains his rank.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Capt. G. S. Phillips, from the Active List, to be Capt.

ROYAL AIR FORCE.

Flight Lt. (Hon. Squadron Leader) C. A. Meaden resigns his tempy. commn. and is permitted to retain the honorary rank of Squadron Leader.

INDIAN MEDICAL SERVICE.

Madhavrao Subrao Katre to be Temp. Lt.

Temp. Capts. relinquishing their commns.: Jatindra Mohan Dutta Gupta (and retains his rank), Jatindra Mohan Banerjee, Krishna Chandra Varma (and retains his rank).

Lt.-Cols. P. M. Rennie and S. A. Ruzzak retire.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1927 statistics of three cities :—

Name of district and estimated mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Diarrhœa, &c., under 2 years.	Maternal mortality from childbirth.
Newcastle-upon-Tyne (288,500)	18·7	12·4	1·39	1·19	2·5	1·7	88/41	9·4	3·7
Salford .. .. (247,600)	17·3	13·9	1·66	1·27	3·5	1·5	81/—	15·6	3·7
Portsmouth .. (232,100)	17·1	12·7	1·00	1·53	2·1	2·2	55 24	3·5	4·5

The death-rates of pre-school (1–5 years) children per 1000 births were: Newcastle-upon-Tyne, 44; Salford, 50, Portsmouth, 42.

Newcastle-upon-Tyne.

Dr. Harold Kerr reports that the coal trade was extremely flat, but that a slight revival in shipbuilding eased unemployment to some extent. The expenditure on poor relief was £383,460 as compared with £486,374 for the previous year and £401,024 for 1925. The year 1927 was cold and grey with a miserable summer. The hours of sunshine were 899 as compared with 1085 in 1926. The atmospheric pollution gauges indicate less tarry matter in the industrial areas than in the residential areas. The "chief sinners" among the factory chimneys belonged to the corporation, but have improved somewhat, although more grit is produced from the tramway's chimney. A regional smoke abatement committee is endeavouring to find a common policy for Tyneside, but finds it difficult to get all the different authorities into line.

An effort has been made to follow up cancer cases, and now that the University has formed a branch of the British Empire Cancer Campaign this investigation promises more success. There were 116 notifications of small-pox with no deaths. Contacts, with the exception of tramps in two lodging-houses, readily accepted vaccination. Diphtheria was relatively less frequent, but the type was more severe, the case-mortality being 7·1 per cent. Encephalitis lethargica has shown a gradual decline since 1924, but of the 21 cases notified in 1927 only one recovered, while 11 died and 8 were rendered incapable of employment by mental or nervous impairment. In May immunisation of the City Hospital staff was adopted both for scarlet fever and diphtheria, and since then no further cases have occurred among them. The beds are now used for a variety of diseases. Thus the admissions included 173 cases of pneumonia, 63 of measles, 55 of erysipelas, 13 of encephalitis lethargica, and 12 of cerebro-spinal fever.

There were 362 new cases of syphilis and 525 of gonorrhœa at the V.D. clinic as compared with 290 of syphilis and 483 of gonorrhœa in 1926. The attendances per case are now 17·5, but 41 per cent. of the patients cease attending before completion of treatment. There were 58 notifications of ophthalmia neonatorum, all of whom recovered. Of 401 registered blind persons, 76 are said to have been blind from birth, but only two are under 5 years of age, and of these one was not born in Newcastle and the other had a congenital malformation of the eye. The decline in diarrhœa (the deaths in 1927 were fewer than ever before) is claimed by Dr. Kerr as a proof of a much better informed motherhood. The babies, however, suffered much from respiratory diseases during this sunless year, in spite of the relative absence of whooping-cough and measles. Dr. Kerr points out that neither the neonatal nor the maternal mortality has declined appreciably during the present century in Newcastle, but that fortunately the mortality from puerperal sepsis is low in Newcastle. The antenatal clinics were attended by 1047 mothers, while the total births were 5395. The infant mortality-rate was 119 in All Saints ward and only 38 in Heaton ward. Attendance at confinements was shared equally by medical practitioners, midwives, and the Princess Mary Maternity Hospital. Free milk is now only distributed to the very poorest; even so, 18⅔ tons of dried milk were distributed free, while 21 tons were delivered at cost price. The increased attendances at the 11 welfare centres makes the provision of more medical sessions urgent. The babies' hospital and mothercraft centre is doing good work for babies suffering from wasting and other chronic conditions, and its grant from the health committee has been increased. The death-rate from tuberculosis, although very high, is lower than it has ever been before in Newcastle and is one of the lowest in the district. Tyneside apparently suffers from a particularly virulent and rapid type of the disease, and in consequence it is difficult to keep the sanatorium beds fully occupied, whereas there is a waiting-list for the "advanced" beds. Workshops for occupational therapy are being established at Barrasford Sanatorium.

Out of 376 milk samples examined for tubercle 14, or 3·7 per cent., were found to be infected. The 334 milch cows stalled within the city are examined at least four times in the year and among them six tuberculous animals were found. Some of the private slaughter-houses are in a "shockingly bad" structural state and there never was a greater need of a public abattoir than at present. Of 188 samples of milk examined for excremental pollution, 40 per cent. were found to be dirty. Between June and September the percentage of dirty milks was 73, and Dr. Kerr comments that there is plenty of room for clean milk competitions and similar efforts. He also points out that two exceedingly well-constructed automatic machines selling milk in pennyworths have been set up in poorer parts of the town and "have been the means of distributing excellent milk in first-class condition."

There is still a vast amount of overcrowding which shows no signs of lessening, although the corporation's contribution during the year to the housing shortage after allowing for "compensatory" houses was 1536. Dr. Kerr gives a cheering account of the manner in which the tenants of the three condemned areas have settled in the houses provided for them in the outskirts and are taking pride in their gardens. There was, it is true, a small residue of confirmed slummers, who had to be evicted and with whom nothing could be done, and a few of the new colonists make no attempt to furnish their houses and will probably drift back to the slums; but "there is no question that the municipal housing has had a wonderful effect in raising the domestic tone of large numbers of the submerged tenth."

Salford.

Dr. H. Osborne shows that there was an increase of 358 deaths over the number occurring in 1926, when the Salford death-rate was the lowest recorded (12·4). The following were some of the principal increases during 1927: influenza 79, pneumonia 74, tuberculosis 39, nephritis 29, violent deaths (excluding suicide) 34, and heart disease 131. Since 1920 the birth-rate has declined year by year from 27·3 to 17·3. The infant mortality-rate of 81 is the lowest ever recorded, and may be compared with the rate of 207 for the quinquennium 1893 to 1897. The work of the maternity and child welfare department is being seriously impeded in the Broughton district by the want of

adequate premises, and the desirability of setting up a combined child welfare and school centre is urged. The maternity home and babies' hospital has at present ten beds for mothers and 18 cots for babies. Many applications for confinement have to be refused, and Dr. Osborne presses for the present building to be devoted to the increased number of 15 maternity beds and for a new building to be erected for the babies' hospital on an adjoining site. All cases booked for the maternity home are invited to attend a special antenatal clinic. The mothers very much appreciate the antenatal clinics and the midwives coöperate well. The babies' hospital does good work in treating cases of marasmus and malnutrition. The artificial light installed in 1926 has proved beneficial, and it is specially noted that the simplest methods of feeding, which can easily be continued by the mothers after discharge, have proved the best for marasmic infants. Some remarkable photographs are given of marasmic infants before and after treatment and are stated to be by no means exceptional cases. The maternity and child welfare scheme includes nine welfare centres and two special treatment clinics. Massage is provided at several centres and has been found useful. Of the 4301 births, 3051 were attended by midwives, who sent for medical help in 1254 cases. The 47 babies, who suffered from ophthalmia, four of which were classed as "very bad" cases, four as "bad," and six as "fairly bad," all recovered without injury to sight. Additions made to the window displays at the health offices included an exhibit on dental hygiene loaned by the Dental Board and another dealing with the prevention of rickets. The Nab Top Sanatorium, which could not be kept full with early cases of tuberculosis, has been profitably used for an increased number of children with early and sometimes indefinite signs of the disease, and an open-air school is being erected for their education. In January, 1927, Dr. G. J. Crawford was appointed "whole-time" city bacteriologist. An improvement scheme affecting 75 houses and 337 persons has been approved for a congested area in the Greengate district. The area will not be used for dwelling-houses, and houses on another site will be provided for the displaced tenants.

Experiments have been continued with smokeless fuel. There are now over 40 "Salford" grates in the Health Department burning vertical dry coke, and similar grates in the hospitals and municipal lodging-house, and it is found that for equivalent heating the cost of these dry coke fires is *only half* that of coal fires. Coalite has also been found satisfactory, and it is hoped that its price will shortly be reduced. The trouble with ordinary gas coke is that it is water-logged. The experiments carried out as to the heating effects of the various fuels are fully described. Interesting comparisons of the amount of tar and soot, as an indication of domestic smoke pollution in Salford, Marple, Liverpool, and Southport are given. Although the total deposit from the atmosphere in Liverpool exceeds that in the central part of Salford, the tar and soot deposit is 20 per cent. higher in the case of Salford. Observations have also been carried out to ascertain the variations of the amount of "sunlight" available as distinguished from "bright sunshine." The method adopted was to expose an acidified solution of potassium iodide and to measure the milligrammes of iodines liberated by the light. The observations have been carried out daily for two years at four stations, namely: (1) Regent-road, in the centre of Salford; (2) Nab Top, Marple, about ten miles to the south-east; (3) Ladywell Sanatorium, in the western suburbs; and (4) Drinkwater Park Hospital, four miles to the north-west. The results were somewhat surprising. A summary of the two years results shows that Drinkwater Park was 16 per cent., Nab Top 11 per cent., and Ladywell Sanatorium 10 per cent. better than Regent-road. The tar and soot deposit at Marple is double that of Southport, and Dr. Osborne suggests that it is sufficiently near the Manchester group of towns to receive the drift of domestic fumes.

The municipal common lodging-house—"Salford House"—is evidently appreciated, as its beds were 95 per cent. occupied during the year, whilst the beds of the other common lodging-houses were only 66 per cent. occupied. There are only 115 milch cows housed in the city, but amongst these two tuberculous udders were found during the year. As regards outside milk, 371 samples were examined for tubercle and 31, or 8·3 per cent., were found to be infected. So far, it is pointed out, the new legislation has produced no improvement in the milk-supply as regards tuberculosis. The very interesting report of the public analyst shows that the Salford Corporation continues its strenuous efforts to circumvent food fakers.

Portsmouth.

Dr. A. Mearns Fraser gives particulars of the present state of the housing problem. During the five years before the war the annual average of new houses was 760. During 1914–18 the number was 160. During the last six years the number of new houses has been 274, 162, 221, 421, 682, and 898 respectively. Of the 898 built in 1927 only two were municipal, but 272 municipal houses are nearing completion. The dock-yard employees are forming a public utility society to erect 160 houses. At the present rate of building, all who are able to pay a rent of 10*s.* to 15*s.* will be provided for at no distant date. During 1896 to 1914 the corporation demolished over 500 unfit houses and removed the worst slum area. The next worst area is now being cleared and the old buildings replaced by modern two-storey tenements. Dr. Fraser goes on to deal with the remaining difficulty—namely, 500 old cottages and houses quite worn out and unfit for habitation, let at rents mostly varying from 3*s.* 6*d.* to 6*s.* 6*d.* per week. Most of these tenants want better accommodation, and a considerable proportion could pay a higher rent. Dr. Fraser describes the scheme, which was approved by the city council in December last. Sites have now been approved and an excellent lay-out and plans for 153 houses and 12 flats have been prepared. When this instalment has been completed some of the worst of the 500 can be dealt with. As accommodation for the dishoused tenants is made available the old houses will be closed and demolished under Part I. of the Housing Act, 1925. The new blocks will resemble some already built consisting of two self-contained houses and four flats, but smaller tenements will be provided for single persons and families of two *only*.

In allocating, families with children will be given the self-contained houses or the tenements on the ground floor. It is estimated that if the houses do not cost more than those at present being erected and the rents average 8*s.* a week the annual loss will be just over one-third of a penny rate, but if, as is probable, a proportion of the tenants cannot pay the new rents further assistance in some form or other will have to be afforded from the rates. It is not likely that the loss will thus be more than doubled and even if it is, Dr. Fraser considers the expenditure justifiable for this public health measure of first-class importance. Examples are given to indicate the deplorable conditions prevailing in these old houses.

Scarlet fever antitoxin was used for 251 cases in the hospital with satisfactory results. The need for beginning the treatment at an early stage of the disease is emphasised.

A chart brings out the fact that whereas formerly 1 out of every 6 babies died in the first year of life, now only 1 out of every 19 dies. The scheme by which pregnant women can for a fee of 5*s.* ensure payment for the services of the doctor, who may need to be called in by the midwife, has been widely used. The total net cost to the local authority for the services of doctors called in by midwives during 1927 was £508, and the cost in the year preceding the scheme was £511. Under the insurance scheme the local authority paid 48 per cent. of the doctors' fees, whereas in the previous year the local authority paid 68 per cent.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED OCT. 27TH, 1928.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 148 (last week, 128); scarlet fever, 3101; diphtheria, 1354; enteric fever, 64; pneumonia, 1047; puerperal fever, 31; puerperal pyrexia, 104; cerebro-spinal fever, 3; acute poliomyelitis, 13; acute polio-encephalitis, 1; encephalitis lethargica, 25; continued fever, 1; dysentery, 8; ophthalmia neonatorum, 103. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Oct. 30th–31st was as follows: Small-pox, under treatment 8, under observation 1; scarlet fever, 2690; diphtheria, 1858; enteric fever, 31; measles, 76; whooping-cough, 277; puerperal fever, 20 (plus 10 babies); encephalitis lethargica, 69; poliomyelitis, 3; "other diseases," 22. At St. Margaret's Hospital there were 16 babies (plus 6 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 1 (1) from enteric fever, 7 (1) from measles, 10 (2) from scarlet fever, 22 (7) from whooping-cough, 29 (4) from diphtheria, 76 (26) from diarrhœa and enteritis under two years, and 76 (17) from influenza. The figures in parentheses are those for London itself.

Two fatal cases of measles were reported from Liverpool and 4 fatal cases of scarlet fever from Leeds. Nottingham reported 3 fatal cases of diphtheria. The deaths from diarrhœa and enteritis under two years are now diminishing; Liverpool reported 7, Manchester 6, and Sunderland 4. The deaths from influenza are beginning to rise.

The number of stillbirths registered during the week in the great towns was 235 (corresponding to a rate of 36 per 1000 births), including 47 in London.

Correspondence.

"Audi alteram partem."

A RADIUM-PLATINUM ALLOY.

To the Editor of THE LANCET.

SIR,—I note in your last issue (p. 932) a short description of an alleged discovery by Dr. Max Heiner, reported from a medical congress at Hamburg. The same wonderful discovery has previously appeared in a more extended form in the lay press and the same claims are made—namely, that an alloy is produced of radium and platinum. Any chemist of but slight experience will at once query the existence of such alloy, as metallic radium is a curiosity. Radium as a metal is like sodium, practically non-existent in the free state, soon oxidising in the presence of water vapour to radium hydroxide.

Let us grant for the moment that Dr. Heiner has produced an alloy of radium and platinum. The next claim is that pointed cylinders are made up and "when introduced into the body radon diffuses into the surrounding tissues and disintegrates intracellularly; so that biological effects are to be expected not only from the gamma rays, but also from the much more potent alpha and beta rays." A beginner with the slightest knowledge of the physics of radium well knows that the alpha rays can be screened by a thin piece of paper. With a dense metal like platinum inan alloy with radium the amount of alpha rays given off from the mere outer skin surface of this needle will therefore be almost nil. Similarly the radium emanation itself will be screened off except from the extreme outside of any metallic alloy. In the classical experiment of Rutherford and Royds to determine the chemical nature of alpha rays the thickness of the glass capillary tube allowing their passage *under pressure* was 0·01 mm. The light diffusible gas, helium itself, did not pass; only the stripped nuclear portion of the atom went through, devoid of planetary electrons, in a nascent state. With platinum, density 21·5, compared with glass, 2·6 (comparative density thus 8·3 to 1), it seems theoretically impossible for any appreciable amount whatsoever of radium emanation to be given off.

Next, as to the beta rays, these in most instances are objectionable and caustic, and indeed would be very variable in amount, being filtered from the centre and all other parts, to the periphery of the alloy needle. Twenty years ago Dominici (*Bulletin de l'Association Française pour l'Étude du Cancer*, Tome 1, No. 1, 1908 (Felix Alcan)), in his original and profoundly accurate description of radium treatment by gamma rays, realised the idea of exact filtration, and the gamma ray treatment, which is all-essential, can only be carried out by scientifically exact primary filtration with platinum *shutting off* alpha and beta rays. This would not be possible in a radium source varying in filtration thickness according to where the individual radium particles were situated in the depths of the needle.

Furthermore, with the standard method of radium therapy, protected by platinum or other appropriate and dense metals, the radium element is contained in the interior of the screen or needle and the important radio-active mineral is preserved for thousands of years, while the screen when worn may be replenished when required. In the case of a "radium alloy," in the course of a few years, from actual application and frictional wear and tear, not only would the platinum be worn down, but the granules of preciously expensive radium interspersed with the platinum would become dispersed and needlessly lost.

I should be pleased to hear the opinions of scientific workers on this question, but as at present reported, this "radium-platinum alloy" appears to me to be a definite retrograde step which is likely to act as a set-back to accurate dosage treatment with radium, which is even now little understood in our country except by specialist radium surgeons.

I am, Sir, yours faithfully,

SPENCER MORT, M.S. Glasg., F.R.S. Edin., (Lt.-Col.); Surgical Director, North Middlesex Hospital.

North Middlesex Hospital, Edmonton, N., Nov. 3rd, 1928.

THE "RANGE OF UREA-CONCENTRATION" TEST.

To the Editor of THE LANCET.

SIR,—In Dr. T. C. Hunt's article on this subject in your last issue there are a number of points with which I am hardly in agreement.

Writing of "small white" and "small red" kidneys, he says:—

"In the first the urea range shows a parallel diminution with that of the maximum concentration, in the second a poor 'MacLean figure' is accompanied by a relatively good range—i.e., a high 'urea index.'"

Also—

"The urea index is seen to bear a close inverse proportion to the degree of nitrogen retention: under 12 it is always associated with a blood-urea above normal, while above 25 it appears to suggest the 'small red' rather than the 'small white' kidney, and to be strong evidence against the presence of any but very slight retention."

First of all, I think most practitioners take the term "small red kidney" to mean the granular or primary contracted kidney—the so-called primary chronic interstitial nephritis (Gaskell)—and associate with it a serious condition in which nitrogen retention is marked. Although Dr. Hunt does refer to this "small red" kidney as the "benign essentially arterio-sclerotic kidney" he is apt to cause confusion in the minds of some by leading them to think that cases which they have been taught to regard as serious, especially when "MacLean's figure" is below normal, may have normal nitrogen retention and a

relatively good prognosis. The class of case to which he refers is, I think, the same as that mentioned by me in the paper on the above test under the heading of hyperpiesia (Case 4 and another)—arterio-sclerotic kidneys—a clinical group in which the brunt of the disease seems to have fallen on the vascular system, the kidney substance suffering in so far as its vessels are affected (nephro-cirrhosis arterio-sclerotica) and generally revealing little or no loss of function. As it is not possible satisfactorily to correlate the signs and symptoms of kidney disease with the underlying pathological condition it is preferable to base our diagnoses or classification on the results of function tests, and in doing this to give the fullest consideration to the state of the cardiovascular system and to other factors having a bearing on the kidneys.

In publishing the test I was careful to avoid any such formula as the "urea index," preferring to leave the "maximum" and "minimum" values as a ratio. All the modern work on œdema shows that water excretion is not only dependent on the condition of the kidneys and the circulation, but also on the state of the plasma and tissues—on the protein osmotic pressure of the plasma, &c. This is one reason, especially in subacute parenchymatous (hydræmic) nephritis why it is inadvisable to use the "urea index"; the ratio itself is all right. The value of water as a test does not run strictly parallel to that of urea concentration as a test, but in any case the figure for dilution enhances the value of that obtained for concentration. For example, in marked hydræmic nephritis a ratio of 4·2/4·0 is quite an ordinary result. The "urea index" would be 4·8. According to the above quotation from Dr. Hunt's paper this always means a blood-urea above normal. We know, however, that in such cases the blood-urea is seldom raised. Again, are we to infer that such an index of 4·8 is of worse omen than one derived from the terminal stages of chronic interstitial (azotæmic) nephritis with a ratio of 1·3/1·1 (index=15·4)? A much truer interpretation is obtained by applying my original *remarks to the* ratio: "taken conjointly the lower the maximum concentration and the more restricted the range the worse the prognosis." Urinary tests of function, anyhow, have a very limited value in acute or subacute kidney conditions where œdema or hydræmia is present.

It is not correct to designate as "MacLean's figure" the maximum obtained in the *range test, as* in some instances where this is low one may be dealing with kidneys that are over-sensitive to urea as a diuretic and in MacLean's test may pass more than the stipulated volumes in the various hourly periods. If by repetition of the latter test the amounts *are still* excessive a calculation must be made to allow for such dilution. The range test avoids this trouble.

The point raised by Dr. Hunt about the collection and examination of samples over longer periods in the water-excretion part of the test was considered afresh when R. S. Allison brought up the matter at the Royal Society of Medicine in November, 1925. I do not think there is any advantage to be gained by prolonging the test for more than three hours (at the most four hours). If the urine is collected hourly for *these* three hours one has sufficient evidence of the diluting power of the kidneys to make a comparison with the concentrating power. Indeed, bearing in mind what has already been said about the part played by factors other than the kidneys in water excretion it is not unlikely that prolonged and elaborate investigations with the water test may, unless great care is taken, lead to wrong conclusions. The normal response to 30 oz. of water taken on an empty stomach is that polyuria occurs within *one-half* to three-quarters of an hour when it *reaches* its maximum and then sinks rapidly. The bulk of the fluid is excreted within three hours. In *damaged kidneys* the polyuria is delayed and the total volume is reduced. Accordingly the only alteration I wish to make in the test (*Brit. Med. Jour.*, 1925, i., 61) is the substitution of the collection of urine for three hourly-periods instead of for two hours. Indeed, one would make little or no mistake if one kept to the two-hour specimen as described, but perhaps the amendment is better. Finally, with reference to post-mortem findings that occasionally seem at variance with the results of the test one should not be too ready to condemn the latter—on the contrary, one should rely rather on ability than appearances. Besides, in "nephritis" other organs and tissues are involved and sometimes may be as much if not more at fault than the kidneys.

I am, Sir, yours faithfully,

E. G. B. CALVERT.

Harley-street, W., Nov. 6th, 1928.

DEATHS UNDER ANÆSTHESIA.

To the Editor of THE LANCET.

SIR,—The suggestion made by Dr. Clausen in his letter of Oct. 27th regarding the Trendelenburg position in spinal analgesia is a very important and valuable one in cases where the blood pressure and pulse-rate are alone affected. If in addition to low blood pressure and increased pulse-rate there is depression of the respiration and cyanosis, as in the case reported, the Trendelenburg position will not only hamper the function of the respiratory organs by the pressure of the abdominal contents against the diaphragm, but also further impede the action of the right heart by an excess of venous blood from the abdomen and lower limbs. In these circumstances, I suggest that a change to the Trendelenburg position may precipitate disaster.

I am, Sir, yours faithfully,

Aberdeen, Nov. 3rd, 1928. J. ROSS MACKENZIE.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

OPENING OF NEW SESSION.

THE last session of the present Parliament was opened by the King in State on Tuesday, Nov. 6th. In the *course of* the gracious speech from the Throne His Majesty said that the estimates for the Services in the coming year, which *would be laid before the House of Commons* in due course, were being prepared with strict attention to the continuing need for economy in public expenditure. The situation in the mining areas continued to engage the earnest attention of the Government who were taking energetic *steps to* promote the success of the scheme of industrial transference and migration. The abnormal expenditure out of the Unemployment Fund entailed by the displacement of labour from the mines would render necessary an increase of borrowing powers, and a Bill dealing with this question would be laid before Parliament. Measures would be presented to both Houses for giving effect in England, Wales, and *Scotland to the comprehensive* scheme which had been prepared by the Government for the reform of the rating system on a more equitable basis, for the reorganisation of local government, and for the readjustment of the financial relations between the State and the local authorities. The proposed changes in local government and in the relations between the Exchequer and the local authorities were measures of far-reaching importance. The Government anticipated that they would enable better *provision* to be made for the health of the people and would direct *assistance* particularly to those areas whose needs were most pressing.

HOUSE OF COMMONS.

TUESDAY, NOV. 6TH.

DEBATE ON THE ADDRESS.

During the debate on the motion that a humble address should be presented to His *Majesty thanking him* for the gracious speech from the Throne,

Lieut.-Colonel FREMANTLE said he hoped, by the help of all well-wishers of factory and workshop legislation on both sides of the House, that they might well be able *to* find time before the end of the *present* session for the passing of the now much-needed and frequently promised Factories

and Workshops Bill. The anticipation in the King's speech that the proposed changes in local government would enable better provision to be made for the health of the people was not encouraging to those who were keen on this or that particular measure of social progress. Still less was the fact that there was no mention of housing at all in the speech an encouragement. They had heard nothing that afternoon in regard to the question of the removal of the housing subsidy, yet it was vital to the housing movement to economise their resources as much as possible, and there was no question that a great deal of the subsidy on houses with a rent of over 1 guinea a week was being thrown away at the present time. The Prime Minister had stated that Parliament would have to deal with the Rent Restrictions Acts in the Expiring Laws Continuance Bill. Those Acts were at the very bottom of their difficulties in connexion with slum property and slum clearance. The development of estates was being delayed because of the exceptional instances of control. Here and there control had held up the erection of houses and had got in the way of development. It was causing inequalities to owners, unjust profiteering on the part of tenants as opposed to subtenants, and a great deal of suffering to subtenants. The Departmental Committee which dealt with this matter, and which represented the Labour Party as well as other parties in the House, recognised the inequalities of the Rent Restriction Acts and control, and recommended a good deal of decontrol. There was abundant reason why the subsidy should be further knocked off houses of the highest rental value. Decontrol and desubsidising were imperative simultaneously. By removing the subsidy on the more expensive houses, which were being adequately provided by private enterprise, much money would be set free by which they would be able to subsidise slum clearances. There was no promise in the speech that the subject of slums was to be dealt with. The Prime Minister said, in December, 1924, when he took office: "We have got to get rid of two things—the shortage in houses and the disgrace of the slums." He (Colonel Fremantle) believed that if they achieved decontrol and desubsidising they could have improvements in the slums.

The report of the Lunacy Commission, which was issued three or four years ago, revealed a system which was insufferably hard on a large number of mental cases. He sincerely hoped that time might be found for legislation on this subject. Referring to small-pox, Colonel Fremantle said that the country was suffering at the present moment from a vast outbreak of preventable disease—small-pox. It had been a mild type of that disease, but the medical profession could give no assurance that it would not become worse. They were sitting on the top of a volcano. He was glad that the great Powers had agreed, under the ægis of the Health Organisation of the League of Nations, to study the question of small-pox. A committee had been formed to study it permanently. Our own country was condemned as being one of the most infected with small-pox of all the civilised countries of the world. It was recognised that we were more behindhand in the application of vaccination than any other country, and other countries recognised the necessity for keeping up their quarantine regulations against us. Vaccination had hitherto been left in the hands of the poor-law guardians, while small-pox was in the hands of the sanitary authority. He hoped that in the reorganisation of local government it would follow, as a result of the Government's scheme, that the matter of vaccination would be under the control of the larger authorities.

Mr. BALDWIN (Prime Minister) said that he regretted that, owing to the overriding necessity of devoting the time of Parliament to the passage of the rating reform proposals of the Government, it would not be possible to deal with the Factories Bill.

SWINEY PRIZE FOR WORK ON MEDICAL JURISPRUDENCE.—The next award of this prize—a silver cup of the value of £100 and money to the same amount—to the author of the best published work on Medical Jurisprudence will take place in January, 1929. The award is made jointly by the Royal Society of Arts and the Royal College of Physicians, and any person desiring to submit a work, or to recommend any work for the consideration of the judges, should do so by letter addressed to the secretary of the Royal Society of Arts, John-street, Adelphi, London, W.C., not later than Nov. 30th.

ROYAL EDINBURGH HOSPITAL FOR INCURABLES.—The managers are considering a scheme of rearrangement of wards, which would enable additional accommodation to be found for women patients, the existing pressure being officially described as "very distressing." Last year, out of 247 applications for admission, only 128 could be accepted, and many of the applicants die before accommodation can be found for them.

Obituary.

SIR HUGH KERR ANDERSON, M.D. CAMB., F.R.C.P. LOND., F.R.S.

Sir Hugh Anderson, Master of Caius College, died on Nov. 2nd at the age of 63, and the University of Cambridge thus loses a man whose services were of exceptional importance. A laboratory worker by choice and training, he became by force of circumstance an administrator, and besides the individual influence which he had always possessed, he came to have a general influence on the trend of education in this country. As initiator and negotiator of large policies he had difficult tasks to perform, but for him the sequel to new responsibilities was always an enlarged circle of respect and friendship.

SIR HUGH ANDERSON.

Hugh Anderson came of the well-known family of shipowners, his mother being a daughter of Surg.-General John Murray. He was educated at Harrow, where he was Sayer Scholar, and on going up to Caius College with an entrance scholarship he took a first in both parts of the Natural Sciences Tripos. Preferring scientific labours to the more lucrative business of shipping, he studied medicine at St. Bartholomew's Hospital, graduated as M.B. in 1891, and returned to Cambridge to work in the physiological laboratory. Until 1905, partly in conjunction with the late Prof. J. N. Langley, and partly alone, he pursued those researches which still form the classical description of the physiology of the sympathetic system in its relation principally to the eye and the pelvic viscera. Much of this investigation, which forms the substance of 28 papers in the *Journal of Physiology*, consisted in counting the number of degenerated and undegenerated nerve-fibres in a single nerve-trunk; for this purpose a short length of the nerve, stained by osmic acid, was teased out, each individual fibre being ranged alongside its fellow on the slide. At such work Anderson, like Langley, was a master, and he was also a very fine operator. His criterion of a proper operation for the excision of a stellate ganglion in the kitten was that it should be done without the shedding of a single drop of blood, and he was an expert in the use of special staining methods. Towards the end of his time in the laboratory he became interested in the histology of the spleen and of the red marrow, and might well have become a hæmatologist had not college finance and organisation stolen him from scientific study.

In 1907 Anderson was elected F.R.S., and five years later he was invited to be Master of his College, which had given him a belated Fellowship in 1897. The invitation came as a surprise and was accepted with characteristic diffidence. Apparently he did not see himself fit for this responsibility, but it was soon obvious to everyone else that the choice was happily inspired. His genius for detail, combined with a clear perception of principle, made him peculiarly

suited for such a post. He was a good judge of character; almost too modest by nature, he was free from any vestige of pompousness; and he was courteous, accessible, and sincerely cordial. He has been called the best beloved man of his generation in Cambridge, and when Caius was turned into a staff college during the war many an officer was grateful for the kindness with which Sir Hugh and Lady Anderson made him feel at home.

In the problems of the University after the war Anderson undoubtedly found scope for many of his talents, though the work may not have been what he would have chosen. Conspicuous capacity for business made him an acceptable collaborator in schemes both large and small, and to all of them, once he was convinced of their soundness, he gave an astonishing and self-sacrificing industry. Perhaps the greatest of his tasks was as member of the two university commissions, the first being that appointed in 1919 to consider the needs of Oxford and Cambridge, and the second being the University of Cambridge Statutory Commission which met in 1922. To his friends in Cambridge it seemed that he bore a great part of the weight of the whole proceedings, and he is credited with originating and carrying through many of the constructive proposals, including the provisions relating to the faculty system. On these commissions he was probably the University's most effective representative, and the Council of the Senate recently entrusted him with the delicate negotiations leading up to the Rockefeller Foundation's munificent proposal to give £700,000 to the University towards the cost of the new library and facilities for research. In all these negotiations it was characteristic of him that the financial authorities of the University, the heads of departments concerned, and the representatives of the Foundation should be able to place such confidence in his fairness and judgment that his scheme went through almost exactly as he outlined it.

From Prof. Joseph Barcroft we have received the following appreciation of his work as a physiologist:—

"My personal recollections of Anderson commence in 1893. He was then 'supervisor in physiology' to my own College, which meant, as far as we were concerned, that we went round to his room in Caius nominally for a class once a week. I there learned to know all the qualities which have won the affection, the respect, and the admiration of all who have come in contact with him. The class, perhaps of three, was supposed to last from 8 to 9 P.M.; we rarely came away before 11. During the three hours of its duration Anderson poured out the fruits of a mind entirely selfless, stimulating, rich in imaginative foresight, meticulous as regards correctness of detail, learned and, of course, honest to the very last. Naturally we left with the feeling that physiology was the one thing worth doing, and the life's work of one at least of his pupils was settled there and then.

"In the years which have passed since then Anderson never changed. His energies were devoted to larger objects, but his method remained essentially the same. He seemed to be able to spend endless time and pains over every difficulty, trifling or large, which his friends brought him—and they all did bring their troubles to him. His correspondence was written in his own hand (until shortly before his death); often he wrote the letters two or three times before they pleased him. He drafted reports in the same way. Had he university buildings under consideration his study table would be covered with plans drawn and coloured by himself. He gave himself without stint to every object which was thrust upon him, and the mystery remains unsolved by his friends of how within the 24 hours of a day he could give such detailed attention to so many subjects. Certainly the solution of that mystery did not lie either in superficiality or in failure of appreciation of large issues. Anderson never lost sight of the wood for the trees, nor in his consideration of the present forgot the possibilities of the future.

"When engaged in physiological research he was always giving of himself to the other workers in the laboratory, his sound critical faculty being helpful to whatever field it was directed. So it remained to the end. Shortly before his death, when he was bearing a weighty burden of affairs, a young worker wrote to him for advice on some matter touching the autonomic system. The next day Anderson made his way to the laboratory in London from which the query came, and devoted at least a couple of hours to the discussion of the problem at issue.

"There is no doubt that the accident of Anderson's diversion to administration (for I think it was largely an accident) was a great loss to science. Against it must be placed the gain which the Universities have reaped from his understanding knowledge of academic needs. Great at administration, he was no mere administrator. In matters financial the heads of departments must, I think, have always felt that in putting their case in Anderson's hands they were placing it where it would receive the greatest consideration, and where every effort would be made to get the most out of the available funds, rather than cut down expenditure irrespective of the loss entailed to academic life. He died in harness, and no better epitaph can be accorded to him than the remark of a friend: 'To have lived without being able to be useful would have been misery to Anderson.'"

At the time of his death Sir Hugh Anderson was a member of the Council of the Royal Society, having previously served in 1917–18. He was also a member of the Medical Research Council, and since 1908 had been chairman of the Syndicate of the Cambridge University Press. He was knighted in 1922, and for many years he had been a governor of Harrow School.

Lady Anderson is the daughter of Surgeon-General F. W. Innes.

FRANK JOSEPH WETHERED, M.D. LOND. AND BRIST., F.R.C.P. LOND.

Dr. F. J. Wethered, whose death at Falmouth on Oct. 28th was announced in our columns last week, had retired to the west country some ten years ago. Although since that time his visits to London were infrequent, he was held in warm remembrance by his colleagues at the hospitals for which he worked and by the staff of this journal, which owed much to his ever-ready help in criticism and comment.

DR. F. J. WETHERED.

Photograph by F. A. Swaine.

Born at Clifton in 1860, the son of Joseph Wethered, Frank was educated at Clifton College, the Bristol Medical School, where he demonstrated in anatomy, and the London Hospital, from which he qualified M.B. Lond., M.R.C.S. Eng., and L.S.A. in 1885. After holding a house appointment at the London Hospital, he visited some of the more famous continental clinics at Berlin and Vienna before taking his higher medical qualifications and beginning his life-work for the special chest hospitals at Victoria Park, City-road, and Brompton. He was appointed medical registrar and teacher of practical medicine to the

Dr. Robert Fletcher Library
L.M.S. Medical College
33305

Middlesex Hospital in 1892, holding the former post for three years, and the latter until 1899, when he was appointed assistant physician, after which he had to wait for 14 years before becoming full physician with charge of beds; from this time until his resignation and retirement there was only a period of five years. With his clinical teaching he combined the post of lecturer at the medical school on medical jurisprudence, a subject in which his interest was by no means academic, for he was at pains, as many of his students gratefully remember, to make his lectures something more than a digest of text-book statements. He was also physician to St. Saviour's Hospital. During the greater part of this time, however, he had another outlet for his growing interest in pulmonary diseases, for in 1894 he was appointed assistant physician to the Brompton Hospital, becoming full physician in 1905, a position which he held for nearly 14 years, when he was appointed consulting physician. It was in the field of pulmonary tuberculosis that his advice as a consulting physician was most frequently sought, and his prize essay for the erection of King Edward VII. Sanatorium in 1902 showed how deeply and thoroughly he had thought out the problems of the treatment of tuberculosis, for his essay was in effect a summary of his own experience in the methods of increasing the resistance of the patient, of promoting and encouraging reparative processes, and of developing compensatory growth and function.

"Although Wethered achieved some success in consulting practice, it may be doubted," writes one of his colleagues, "whether this success was commensurate with his undoubted ability and attainments. Of upright, high-principled, and somewhat sensitive nature, the uncertainties of diagnosis and the disappointments of treatment not infrequently oppressed him. Quite early in his professional career he was attracted to the more exact methods of diagnosis, and in 1890 he collaborated with Dr. W. Essex Wynter in the production of a 'Guide to Methods of Clinical Investigation,' one of the early works in English on this subject, showing how clearly the authors foresaw the trend of modern medical practice. The book covered a very wide field, and abounded in practical hints of value to the student, avoiding anything discursive or irrelevant, and the illustrations were a model of excellence for their time. The marriage of his daughter to the late Dr. A. Conyers Inman, clinical pathologist to the Brompton Hospital, later revived Wethered's interest in this subject, and stimulated him to a careful trial of vaccines in the treatment of pulmonary affections. It was the death of Mrs. Inman, his dearly loved only child, as a direct consequence of an infection acquired during war work in hospital, together with his own increasing susceptibility to catarrhal conditions, that determined his retirement from London, although the stress of his work as Captain, R.A.M.C. (T.), at No. 3 London General Hospital, Wandsworth, no doubt contributed to his decision."

Outside his hospital work Dr. Wethered acted as medical adviser to the Equity and Law Life Assurance Society, and examined in medicine for the Royal College of Physicians of London. He was examining physician in London to the Ventnor Consumption Hospital and treasurer to the Medical Defence Union. "All the work Wethered undertook," continues his colleague, "was carried out conscientiously and unstintingly, including arduous work on committees and administrative duties. It was, however, as host in his charmingly furnished house in Harley-street that he was seen at his best. He loved to entertain his friends, colleagues, and hospital assistants. This he did generously and informally, and at these times the happiness of his home life and the devotion of wife and daughter were apparent to all. Wethered will live long in the memory of his friends as a generous, honourable, and loyal man."

After his retirement to Falmouth Dr. Wethered took an active part in the life of the town. He was a consulting physician at the Falmouth Hospital, for a time also at the Royal Cornwall Sailors' Hospital, and he placed his knowledge and experience at the disposal of the staff of Tehidy Sanatorium. He was a member of the local church council and a regular supporter of the Falmouth Parish Church. His leisure gave him the desired opportunity to indulge in the outdoor sports of which he had always been fond, especially sea-fishing.

Dr. Wethered married, in 1889, Rose, daughter of the late Edward How, who survives him. The interment at St. Marylebone Cemetery on Nov. 1st was attended by many of his old friends and colleagues as a mark of affection and esteem.

SIR GEORGE STEWART ABRAM, M.B. CAMB., M.R.C.S. ENG.

THE death of Sir Stewart Abram, which occurred on Oct. 24th at the age of 62 years, robs the Royal Berks Hospital of its senior physician and the town of Reading of one of its most distinguished citizens.

Son of George Abram, of Middle Temple-lane, he was educated at Merchant Taylors' School and at Caius College, Cambridge, where he took a second class in the Natural Science Tripos. From Cambridge he went on to University College Hospital, London, where he obtained the gold medal in midwifery and won distinction in clinical medicine before qualifying as M.B., B.Chir. Camb. in 1891 and taking his conjoint qualification in the same year. He then served as house physician at his own hospital and assistant house surgeon at the Devon and Exeter Hospital. In 1893 he settled in Reading, where he soon acquired an extensive practice and was appointed to the honorary staff of the Royal Berks Hospital in 1904. His clinical work was marked with a strong vein of common sense and a catholicity of interest which is shown in a number of short communications at various times to our own columns. But Abram did not confine his energies to purely professional work. A man of great personal gifts and of indefatigable energy, he was elected shortly after his advent in Reading a member of the town council, serving on it for over 30 years and becoming in 1908 chairman of the health committee, in the work of which he took a leading part; for a considerable period he was also chairman of the Reading Education Committee. In 1919 he was elected an alderman of the borough and was straightway chosen to be Mayor. During his period of office he was mainly responsible for the Reading Historical Pageant, in which he himself was a notable figure. He was also a governor of Reading School, a member of the Court of the University of Reading, an ex-President of the Reading Pathological Society, and a member of numberless charitable, welfare, and athletic committees.

SIR STEWART ABRAM.

Photograph by Drake, Reading.

In addition to these varied activities Abram led a busy political life; he was a strong Conservative and

a source of strength to the organisation of the party in the town. For many years he was chairman and, of late, President of the Reading Conservative and Unionist Association. A fluent and graceful speaker, he was in request at both political and non-political gatherings. In January, 1922, his public services were recognised by the conferment of a knighthood. During the war he was a territorial major in the Royal Army Medical Corps and was in command of one of the large war hospitals in Reading. He was interested in all kinds of sport, was an active tennis player, and an amateur actor of some ability.

A few years ago Sir Stewart Abram developed a malignant growth for which he underwent a severe operation. This, on the testimony of a friend and colleague, he faced in the most courageous manner, going about his ordinary work cheerfully until the eve of his admission to the nursing home. After his convalescence he returned to all his activities, in spite of obvious disabilities and to the wonder of all. "Supported," writes W. B. S., "as he had always been, by his heroic wife, he afforded a fine example of pluck in the face of what must have been continual anxiety. As the years went by all hoped that he had been permanently cured, but in the summer of this year lung symptoms commenced, due to a recurrence of the disease. He had always said that he would die in harness, and he continued at work until a week before his death. Abram loved his work and he loved his town. It can truly be said that few men have laboured so unceasingly for the good of their fellows. His untiring energy was amazing. His life's work has indeed been well done."

Owing to his great services to Reading it was recently decided to confer the freedom of the borough on Sir Stewart Abram. It was recognised that the time was short and the presentation was made and the roll signed in his bedroom some seven hours only before he died.

He leaves a widow, a son, and two married daughters.

THE photograph of Sir Charles Tomes in our last issue was by Elliott and Fry, Ltd.; that of Mr. Louis Cassidy by Lafayette.

Medical News.

ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—As the result of the Final Conjoint Examination held from Oct. 1st to 23rd the following cand dates were approved in the undermentioned subjects, but are not eligible for diplomas:—

Medicine.—S. S. Ahluwalia, Univ. Coll.; Annie G. Busher, Royal Free; W. J. Cotton and R. Cutler, Guy's; Catherine Day, Royal Free; H. A. Eason, London; Mary G. H. Edwards, St. Mary's; J. A. Fernandez, Univ. Coll.; W. R. Forrester Wood, Cambridge and St. Bart.'s; Joan Goodger, Charing Cross; Margaret L. Hamburger, Royal Free; E. J. Hamp and J. M. Harker, London; A. H. Hussein, Cairo; A. E. Hutton, Westminster; M. Luckeenarain and Dorothy M. Lufkin, Univ. Coll.; R. Machray, Westminster; R. S. Marya, A. Mathews, and M. V. Modi, London; Jocelyn A. M. Moore, Royal Free; W. R. C. Morris, London; B. A. Moss, Guy's; J. E. Myers, London; T. H. Negus, St. Thomas's; J. C. Nicholson, Oxford and St. Bart.'s; W. G. Oakley, Cambridge and St. Bart.'s; A. F. Parker, London; W. Pearce, Leeds; G. E. A. Prins, St. Mary's; Marjorie E. Roberts, Royal Free; J. D. Simpson, Cambridge and London; A. E. M. Soliman, Cairo and London; C. M. E. Warner, King's Coll.; S. A. Wickremasinghe, St. Bart.'s; A. W. Williams, Cambridge and Westminster; J. D. Williams, Cardiff; Beatrice M. Willmott, Cambridge and Birmingham; and Mary Worthington, Royal Free.

Midwifery.—G. G. Allan, Cambridge and Univ. Coll.; K. Alman-Vicherashnia, Kiev and Royal Free; R. W. F. Alles, Middlesex; S. Annaswami, Madras; C. Arthur, Cambridge and St. George's; F. I. Ashton, St. Thomas's; Kathleen W. Arkwin-Gibson, Westminster; C. P. Bailey, Cambridge and St. George's; D. P. Ball, Punjab; T. S. Belcher, London; H. J. W. Bergh, St. George's; W. R. Bett, St. Bart.'s; G. R. Bhatia, Middlesex; D. Bielenky, Westminster; M. Bloom, Cardiff; J. J. Boulle, London; R. H. A. Bovet, Guy's; Bertha A. Briant, Royal Free; J. Brittenden, Berlin and London; T. D. T. Brocklehurst and J. G. Q. Brown, Guy's; V. L. C. Cadogan, Univ. Coll.; P. Chandra, Punjab and St. George's; H. L. Chopra, Punjab; Mabel J. Cooke, Royal Free; F. S. Cooksey, King's Coll.; C. F. Cosin, Guy's; S. T. Crowther, Cardiff; R. Cutler, Guy's; J. H. Cyriax, Cambridge and St. Thomas's; Catherine Day, Royal Free; E. M. Dimock, Cambridge and Univ. Coll.; Jessie E. Dodds, Sheffield; A. Eckford, Guy's; J. A. Eddy, Oxford and Middlesex; L. M. Edwards, St. Bart.'s; A. C. Elkin, Univ. Coll.; R. B. H. Faichney, Liverpool; T. D. Finey, London; A. W. Franklin, Cambridge and St. Bart.'s; T. Fritz, London; L. Gabbe, Guy's; T. C. R. George, St. Bart.'s; N. D. Gerrish, Bristol; W. S. Ghai, Charing Cross; P. J. E. Godard, Paris and Lausanne; M. W. Gonin, St. Bart.'s; A. J. Groenewald, Guy's; E. Grundy, Leeds; L. Grunis, London; A. S. Hall, Cambridge and St. George's; Margaret L. Hamburger, Royal Free; P. N. Hanson, St. Bart.'s; H. M. Harris, Oxford and London; G. F. Harrison, St. Thomas's; K. W. D. Hartley, St. Bart.'s; Columba M. D. Heathcote, Charing Cross; F. F. Hellier, Cambridge and Leeds; A. H. Hennessy, Adelaide and London; R. Herring, St. Mary's; R. C. Holderness, Leeds; F. W. Holdsworth, Cambridge and St. George's; G. J. Hollis, Guy's; Ethel E. Hopper, Charing Cross; C. Hortop and A. D. H. Hugo, Guy's; E. F. Hunt, St. George's; R. I. Hyder, London; C. G. Jobbins, Cambridge and St. Thomas's; C. Jones, Leeds; H. W. Jordan, Univ. Coll.; D. W. S. Kaye, King's Coll.; M. S. Khan, Cambridge and Middlesex; T. H. Khan, King's Coll.; R. J. Krogh, Bristol; S. Lal, Lahore; A. J. C. Latchmore, Leeds; C. Leben, Univ. Coll.; A. Liberis, St. Bart.'s; P. A. T. Lowden, St. Thomas's; J. V. Lucas, Cambridge and Bristol; H. G. McGregor, Guy's; S. I. McMillen, Pennsylvania; F. M. Mallinson, Univ. Coll.; R. S. Mann, Cambridge and Univ. Coll.; F. W. Marshall, King's Coll.; R. S. Marya, Punjab and London; A. Mathews, London; V. L. Misso, Singapore and King's Coll.; S. N. Mistri and W. R. C. Morris, London; Margaret Naylor, Sheffield; A. H. Nelson, Charing Cross; R. J. L. O'Donoghue, Guy's; B. W. Paine, Univ. Coll.; C. T. E. Parsons, St. Bart.'s; T. B. Pitts, Guy's; R. K. Price, St. Bart.'s; F. S. C. Pritchard, Guy's; R. Purvis, St. Thomas's; Alison J. Rae, Royal Free; T. V. Rajagopalan, Madras; A. B. Rao, Middlesex; B. V. P. Reddy, London; P. J. Richards, Cambridge and St. Bart.'s; A. C. Riley, St. Bart.'s; Marjorie E. Roberts, Royal Free; Ivy H. V. Rowlands, Liverpool; C. R. Salkeld, Oxford and St. Thomas's; R. M. Sargent, Univ. Coll.; T. L. Scott, St. Mary's; S. Segalov, St. Bart.'s; Sybil C. Selby-Green, Westminster; W. H. H. Serasinghe, Middlesex; V. Seshagiri-Rao, Madras; E. M. Sharples, St. Bart.'s; H. J. Shorvon, St. Thomas's; A. D. Skyrme, Cambridge and London; A. M. Soliman, Cairo and London; H. Stark, St. Bart.'s; Ada M. W. Stewart, Liverpool and Univ. Coll.; G. D. Stilwell, St. Thomas's; L. Sumitra, St. Mary's; E. C. Sugden, Cambridge and St. Bart.'s; B. L. Taneja, Lahore and Guy's; H. Taylor, Cambridge and St. Bart.'s; V. C. Thompson and C. R. Todd, St. Bart.'s; Decima M. Tracey, Royal Free; A. E. Treweek, Guy's; D. P. Turner, King's Coll.; G. E. M. Turner, Middlesex; G. Vaishnavi, Punjab; J. J. van Niekerk, Guy's; Frances J. Vinter, Royal Free; W. E. Wainman, Leeds; W. J. Walter, Oxford and St. Bart.'s; V. W. L. Wells, Guy's; S. A. Wickremasinghe, Ceylon and St. Bart.'s; S. J. Wheeler, Guy's; R. P. White, Cambridge and St. Bart.'s; D. C. Williams, Cardiff; J. O. Williams, St. Bart.'s; Sibyl O. Williams, Calcutta and Royal Free; E. R. Willis, London; Beatrice M. Willmott, Cambridge and Birmingham; B. Wright, Cambridge and St. Bart.'s; Winifred M. Wright, Royal Free; P. Yarmarko and D. J. Young, Middlesex; and R. H. Young, Cambridge and St. Thomas's.

Surgery.—W. Addey, Manchester; C. L. Ahluwalia, Charing Cross; C. Arthur, St. George's; M. W. Atkinson, Middlesex; R. C. Bennett, St. Bart.'s; A. D. D. Broughton, London; G. H. Buck, Oxford and Westminster; G. C. Cochrane, London; J. E. Curnock, Charing Cross; E. M. Dimock, Univ. Coll.; J. A. Eddy, Middlesex; M. A. A. El Gammal, Cairo; A. C. Elkin, Univ. Coll.; T. C. J. Evans, St. Mary's; A. D. Everett, St. Bart.'s; R. B. H. Faichney, Liverpool; E. Foster, Cardiff; P. J. E. Godard, Paris and Lausanne; M. W. Gonin, St. Bart.'s; A. J. Groenewald, Guy's; R. G. Gwynne, Adelaide and London; A. S. Hall, St. George's; H. M. Harris, Oxford and London; G. F. Harrison, St. Thomas's; Dorothy C. Hay, King's Coll.; W. Heath, St. Bart.'s; C. E. Holden, Cambridge and St. Bart.'s; F. W. Holdsworth, Cambridge and St. George's; G. J. Hollis, Guy's; R. G. S. Howe, Univ. Coll.; A. E. Hutton, Westminster; R. I. Hyder, London; D. E. Hyman, Manchester; C. G. Jobbins and W. H. P. Jonas, St. Thomas's; C. Jones, Leeds; H. W. Jordan and C. Leben, Univ. Coll.; L. C. Lodge, Middlesex; R. Machray, Westminster; F. W. Marshall, King's Coll.; R. A. Maynard, Cambridge and St. Thomas's; J. C. Nicholson, Oxford and St. Bart.'s; P. L. Nirula, Punjab; T. Parakutty-Ammal, Royal Free; E. R. G. Passe, London; F. Pomarantz, St. Bart.'s; R. Purvis, St. Thomas's; Florence Ram, Cambridge and Sheffield; A. B. Rao, Middlesex; A. C. Riley, St. Bart.'s; E. B. Rogers, Guy's; B. Rothery, St. George's; A. S. D. Russell, St. Thomas's; T. L. Scott, St. Mary's; J. D. Simpson and B. Singer, London; E. Sladen and C. E. Soodeen, Middlesex; B. Stanley, Univ. Coll.; E. T. W. Starkie, St. Mary's; E. C. Sugden, Cambridge and St. Bart.'s; Bertha D. Upton-Jones, Royal Free; E. Vitenson, Guy's; W. E. Wainman, Leeds; R. P. White and A. G. Williams, St. Bart.'s; Kathleen Wilson, King's Coll.; and W. R. Winterton and M. R. Zada, Middlesex.

Pathology.—A. D. Everett, St. Bart.'s; A. Gilpin, King's Coll.; E. Grundy, Leeds; J. M. Harker, London; R. C.

Holderness, Leeds; Geraldine J. G. Hayes, Manchester; D. W. S. Kaye, King's Coll.; S. D. McClean, Guy's; J. R. Owen, Birmingham; R. A. C. Rice, St. Bart.'s; T. S. Rodgers, Westminster; C. Skinner, Guy's; A. R. Smith, St. Thomas's; I. Taylor, King's Coll.; and A. Wiseman, Guy's.

UNIVERSITY OF OXFORD.—The following scholarships have been awarded:—Theodore Williams Scholarship in Physiology: Robert A. Beaver. Theodore Williams Scholarship in Anatomy: Renatus Kempthorne and Aldwyn B. Stokes, B.A. (equal). Theodore Williams Scholarship in Pathology: Frank Hawking. Radcliffe Scholarship in Pharmacology: Hedley John Barnard Atkins and John Henderson Hunt (equal).

UNIVERSITY OF CAMBRIDGE.—It is proposed to confer the honorary degree of Master of Arts upon Mr. W. H. Bowen, F.R.C.S., surgeon to Addenbrooke's Hospital.

UNIVERSITY OF EDINBURGH.—Sir Leybourne Davidson has given £5000 to found and endow a Fellowship in Bacteriology and Immunology in the University.

ROYAL SOCIETY OF ARTS.—The Cantor lecture on Biology and Refrigeration will be delivered by Mr. Franklin Kidd, D.Sc., on Nov. 12th, at 8 P.M., at the house of the Society at John-street, Adelphi, London, W.C.

BRITISH INSTITUTE OF PHILOSOPHICAL STUDIES.—Dr. C. S. Myers, F.R.S., will take the chair at a lecture on Race and Civilisation, to be given by Mr. Morris Ginsberg at 8.15 P.M., on Tuesday, Nov. 13th, at the Royal Society of Arts, 18, John-street, Adelphi, W.C.

MEDICO-LEGAL SOCIETY.—A meeting will be held at 11, Chandos-street, Cavendish-square, London, W., on Nov. 22nd, at 8.30 P.M., when a paper will be read by Dr. L. A. Weatherly on Juvenile Psychologic Delinquencies—their Origin and Treatment, which will be followed by a discussion.

WEST KENT MEDICO-CHIRURGICAL SOCIETY.—A meeting of this Society will be held at the Miller General Hospital, Greenwich, to-day, Friday, Nov. 9th, at 8.45 p.m., when Mr. C. A. Joll, the President, will take the chair, and Dr. J. A. Ryle will give an address on Some Symptoms and Consequences of Arterial Disease.

LONDON CLINIC FOR RHEUMATISM.—Sir Otto Beit, who in May last gave £10,000 in answer to the British Red Cross Society's appeal for £40,000 to establish a clinic in London for the treatment and study of rheumatic diseases, has now sent a further donation of £3474 18*s.* 9*d.*, being the amount required to complete the sum asked for.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.—The annual dinner of this society will be held at the Piccadilly Hotel, W., on Thursday, Nov. 15th, at 7.30 P.M. (Reception at 7.10 P.M.) Ladies are invited, and members, or candidates nominated for election, are asked to give early notice to the executive secretary of their intention to be present, with the names of their guests.

ABERDEEN UNIVERSITY CLUB, LONDON.—This club will hold its eightieth half-yearly dinner at the Trocadero Restaurant on Nov. 22nd, with Lord Meston, Chancellor of the University, in the chair, and with the Earl of Birkenhead, Rector of the University, as principal guest. Application for tickets to the secretary, 9, Addison-gardens, Kensington, W. 14.

COLLEGE OF NURSING.—Miss Cox-Davies, C.B.E., has been appointed president of the College in succession to Miss Gill, who has retired owing to ill-health. At one time matron of the Royal Free Hospital, London, Miss Cox-Davies was a principal matron of the Territorial Army Nursing Service during the war, and was decorated with the Royal Red Cross and bar. She is a member of the General Nursing Council.

DONATIONS AND BEQUESTS.—Under the will of the late Mr. E. Freaker, of Windsor, who left the residue of his estate to King Edward VII. Hospital, that institution will receive about £10,000.—Mr. William Greenwood, of Lytham, Lancs, left £1000 to the Rochdale Infirmary and £500 to the Cottage Hospital, Lytham.—The Invalid Children's Aid Association of Manchester and Salford has received an anonymous gift of £1000.—Mr. Maximilien Maurice Samuel, of Willesden-lane, London, on his wife's decease, left £1000 to the Willesden General Infirmary.—Mr. Levy, chairman of the Ardath Tobacco Co., Ltd., has given £2000 to the New Bethlem Hospital Building Fund.

ROYAL SOCIETY.—At the anniversary meeting on Nov. 30th the President and Council will recommend that Dr. H. H. Dale be re-elected as one of the society's two secretaries, whilst Dr. Charles Bolton, Dr. C. G. Douglas, Sir Frederick Hopkins, Prof. J. C. G. Ledingham, and Prof. G. Elliot Smith are among the Fellows nominated to the Council.

THE IRIS FOX MEMORIAL.—The Committee of this Fund announce that a total of £355 has been collected, and that it is proposed to utilise the money for a pathological library at the Royal Free Hospital to be named the Iris Fox Library.

Dr. Thomas Goodall Nasmyth has been appointed a Deputy Lieutenant of Edinburgh.

Dr. Herbert Gordon Thompson has resigned his post in charge of the Church Missionary Society's Hospital at Hangchow, China, on being appointed to the Chair of Surgery at the Henry Lester Institute, Shanghai.

UNIVERSITY OF LONDON MEDICAL GRADUATES' SOCIETY.—The autumn dinner of this society was held at the Langham Hotel, London, on Oct. 31st, with the President, Sir StClair Thomson, in the chair, and Dr. M. Hajek, Professor of Rhino-Laryngology in the University of Vienna, and Dr. Waldapfel, his assistant, as the guests of honour. After referring to the increasing membership of the society, which now includes 200 life members, he pointed out that the medical graduates of the University numbered upwards of 4500, and expressed a hope that a larger proportion would join as time went on. He expressed the society's welcome to Prof. Hajek, who responded. Mr. W. McAdam Eccles recounted the success achieved in the Birmingham area through the energy and initiative of Prof. W. Billington, in consequence of which the first extra-metropolitan dinner of the society will be held in Birmingham on Nov. 23rd at 7.30 P.M., in the Queen's Hotel, with Sir StClair Thomson in the chair. Sir Holburt Waring then described some of the latest developments with regard to the Bloomsbury site. He stated that 11 acres had been acquired for £535,000, consisting of four blocks through which ran two roads crosswise. At present the University was receiving £14,000 per annum in rentals from these buildings. Legislation had had to be sought by which the University would be enabled to close these two intersecting roads, the roads to the south and east sides of the area being widened as a compensatory measure. The necessary powers had been successfully achieved, with the help of the London County Council, and the University was now able to go ahead with the development scheme. The authorities were now trying to decide what institutions, colleges, and special departments should be erected upon the site. When this had been decided, after consultation with the various bodies concerned, designs for the whole plan of the area would be invited from leading architectural authorities. The purchase of the site had been finally accomplished by arrangement with the Treasury, the Rockefeller Institute, and the University trustees.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, Nov. 12th.—5 P.M., WAR. Paper: Major W. D. Keyworth, I.M.S.: Severe Malaria among British Troops in the East African Campaign. (Communicated by Major Herrick, I.M.S.)

TUESDAY.—5 P.M., THERAPEUTICS AND TROPICAL DISEASES. Joint discussion on the Special Uses of Antimony. Opener: Dr. J. B. Christopherson. Other Speakers: Prof. A. J. Gunn, Sir Leonard Rogers, and others. 8.30 P.M., PSYCHIATRY. Presidential Address: Sir Maurice Craig: A Survey of Some Conditions Conducive to Mental Disturbance, with Suggestions as to Their Treatment.

WEDNESDAY.—5.30 P.M., SURGERY: SUBSECTION OF PROCTOLOGY. Discussion on Urinary Infections after Excision of the Rectum; Their Cause and Prevention. To be opened by Dr. Cuthbert Dukes. Demonstration of pathological specimens. 8.15 P.M., ELECTRO-THERAPEUTICS. Mackenzie Davidson Memorial Lecture: Prof. W. L. Bragg: X Ray Optics (illustrated by experiments). (*Note.*—There will be no meeting of the Section of Electro-Therapeutics on Friday, Nov. 16th.)

THURSDAY.—5 P.M., DERMATOLOGY. (Cases at 4 P.M.) Cases: Dr. H. C. Semon: Keratodermia Punctata. Other cases will be shown. Annual Dinner of the Society: May Fair Hotel, W. 1, 7.30 for 8 P.M.

FRIDAY.—8 P.M., OBSTETRICS. Short Communication: Dr. J. D. Barris and Dr. Wilfred Shaw: Rhabdomyosarcoma of the Ovaries. Papers: Prof. Donald and Prof. Fletcher Shaw: Age-incidence in Carcinoma of the Body of the Uterus. Dr. James Young (Edinburgh): The Prognosis and Treatment of Late Pregnancy Toxæmia.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

MONDAY, Nov. 12th.—8.30 P.M., discussion on the Medico-Legal Aspects of Fractures, to be introduced by Prof. E. Hey Groves and Dr. James Neal.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.

THURSDAY, Nov. 15th.—8.15 P.M. (at the London School of Hygiene and Tropical Medicine, Endsleigh-gardens, Euston-road, W.C.), Laboratory Meeting. Demonstrations by Major H. C. Brown and Dr. W. T. C. Broom; Dr. P. A. Buxton; Dr. L. J. Davis; Mr. B. Joblin; Dr. Salisbury Sharpe; Miss E. K. Sikes; Dr. A. C. Stevenson; Dr. C. M. Wenyon and Dr. E. Hindle; Dr. V. B. Wigglesworth; and Prof. Warrington Yorke. A cinematograph film will also be shown entitled Scenes in the Kala-azar Endemic Areas in Bengal, by Dr. L. E. Napier, of Calcutta.

BIOCHEMICAL SOCIETY.

FRIDAY, Nov. 16th.—5 P.M. (in St. Thomas's Hospital Medical School). Communications:—V. B. Reader: A Third Factor Present in Marmite, Necessary for the Nutrition of the Rat. H. J. Holman and S. B. Schryver: The Separation of the Basic Products of the Hydrolysis of Proteins. J. R. Marrack: Ketosis in Sea-sickness. L. J. Harris and T. Moore: Hypervitaminosis. M. G. Eggleton and P. Eggleton: A Method of Estimating Phosphagen and other Phosphorus Compounds in Voluntary Muscle. W. J. N. Burch: A Synthesis of Hydroxyglutamic Acid. W. J. N. Burch and R. H. A. Plimmer: Esters of Phosphoric Acid. J. Lowndes and R. H. A. Plimmer: Bromination of Histidine. R. H. A. Plimmer, W. H. Raymond, and J. Lowndes: Comparative Vitamin B Values of Foodstuffs. H. Allen, F. Dickens, E. C. Dodds, and F. C. Howitt: A Study of the Œstrus-producing Hormone, with Special Reference to its Preparation and Standardisation in a Water-soluble Form.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, Nov. 12th.—10 A.M., Dr. [illegible] ment. 11 A.M., Mr. Tyrrell [illegible] 2 P.M., Mr. Simmonds: Surg[illegible]

TUESDAY.—11 A.M., Mr. Endea[illegible] (demonstration). 2 P.M., Dr. Shaw: Medical Out-patients. 2 P.M., Mr. Hamblen Thomas: Throat, Nose and Ear Department.

WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. 2 P.M., Mr. Tyrrell Gray: Operations. 2.30 P.M., Mr. Donald Armour: Surgical Wards.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 2 P.M., Dr. Ironside: Medical Out-patients. 2 P.M., Mr. Bishop Harman: Eye Department.

FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department. 4.30 P.M., Special lecture: Mr. Vlasto: Hoarseness.

SATURDAY.—9 A.M., Mr. Vlasto: Operation on Throat, Nose and Ear. 9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Diseases of Children.

Daily 10 A.M. to 5 P.M., Saturdays 10 A.M. to 12 noon. Medical and Surgical In-patients and Out-patients, Operations, Special Departments, Anæsthetic Course.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Nov. 12th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Nov. 12th, to SATURDAY, Nov. 17th.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Lectures by Dr. H. C. Semon: Some Basic Remedies in Diseases of the Skin, on Mon., at 5 P.M.—WELLCOME MUSEUM OF MEDICAL SCIENCE, 53, Gordon-street, W.C. Wed., at 4 P.M., demonstration by Colonel L. W. Harrison: Syphilis Now and Twenty Years Ago.—CENTRAL LONDON OPHTHALMIC HOSPITAL, Judd-street, W.C. Mon., at 4.30 P.M. clinical demonstration by Mr. Williamson-Noble. There are no fees for the above.—SOUTH LONDON HOSPITAL FOR WOMEN, 103, South Side, Clapham Common, S.W. Fri., at 2 P.M., clinical demonstration by Miss Davies-Colley and her colleagues. This demonstration is free to women graduates *only*.—ROYAL WATERLOO HOSPITAL FOR WOMEN AND CHILDREN, Waterloo-road, S.E. Special post-graduate course in medicine, surgery, and gynæcology.—ROYAL WESTMINSTER OPHTHALMIC HOSPITAL, Broad-street, Holborn, W.C. Special course in ophthalmology.—ST. MARK'S HOSPITAL, City-road, E.C. One week's special course. Further information from the Secretary.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY, Nov. 15th.—4 P.M., Dr. Frew: Enuresis.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.

FRIDAY, Nov. 16th.—4 P.M., Diseases of the Maxillary Antrum.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

TUESDAY, Nov. 13th.—3.15 P.M. (at the Royal Chest Hospital), Dr. P. Kerley: The X Ray Diagnosis of Pulmonary Tuberculosis.

ST. PAUL'S HOSPITAL POST-GRADUATE COURSE, Endell-street, W.C.

WEDNESDAY, Nov. 14th.—4.30 P.M., Mr. H. P. Winsbury White: Stone in the Upper Urinary Tract.

UNIVERSITY COLLEGE, Gower-street, W.C.

MONDAY, Nov. 12th.—5 P.M., Prof. E. B. Verney: Urinary Secretion. (Fifth lecture.)

WEDNESDAY.—5.30 P.M., Dr. J. Owens, A.M.I.C.E.: Smoke Pollution of the Air and Public Health. (Last lecture.)

FRIDAY.—5 P.M., Prof. J. C. Drummond: Recent Work on Vitamins. (Last lecture.)

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.

WEDNESDAY, Nov. 14th.—4 P.M., Dr. R. H. B. Adamson: The Health of Women and Girls in Relation to Industry.

CHADWICK PUBLIC LECTURES.

MONDAY, Nov. 12th.—8 P.M. (at Royal Institution of Civil Engineers, Great George-street, Westminster), Mr. H. E. Stilgoe, M.Inst.C.E.: Some Aspects of the London Water-supply.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, Nov. 13th.—5 P.M., Dr. Wilfrid Fox: Nævi.

THURSDAY.—5 P.M., Dr. I. Muende: Pathology Demonstration.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.

FRIDAY, Nov. 16th.—3.30 P.M., Mr. Mouat: Surgical Cases.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, Nov. 13th.—4.15 P.M., Dr. W. Dyson: Demonstration of Dermatological Cases.

FRIDAY.—4.15 P.M., Dr. W. G. Thomson: Certification in Lunacy.

ANCOATS HOSPITAL POST-GRADUATE LECTURES, Mill-street, Manchester.

THURSDAY, Nov. 15th.—3.45 P.M., Dr. Renshaw: Urine—Laboratory Aids to Diagnosis.

Appointments.

FALLON, M. F., M.B., B.Ch. Belf., has been appointed Assistant Medical Officer of Health for Bury, Lancashire.

Certifying Surgeons under the Factory and Workshop Acts: DAVIES, A. J. M., L.M.S.S.A. (Corris, Merioneth); HERRINGTON, C. E. E., M.B., B.S. Lond., D.P.H. (Erith, Kent.); and WYSARD, A. T., L.R.C.P. Lond., M.R.C.S. (Pangbourne, Berks).

Vacancies.

For further information refer to the advertisement columns.

Birmingham and Midland Homœopathic Hospital, Easy-row.—H.S. £150.

Birmingham, Midland Ear and Throat Hospital.—Asst. Surg. O. Also Second H.S. £200 and £150 respectively.

Birmingham, Queen's Hospital.—Asst. Ophth. Surg. £50.

Cambridge, Papworth Village Settlement.—H.P. At rate of £100.

Cardiff, King Edward VII, Welsh National Memorial Association. Asst. Tuber. P. £600. Also Third Asst. Res. M.O. to N. Wales Sanatorium, Llangwyfan. £200.

Chester, Royal Infirmary.—Three H.S.'s. Each £120.

City of London Hospital for Diseases of the Heart, &c., Victoria Park, E.—Res. M.O. £250. Also H.P. At rate of £100.

Croydon, General Hospital.—Res. M.O. £200.

Dreadnought Hospital, Greenwich.—Med. Supt. £300.

Dublin, Royal City of Dublin Hospital, Upper Baggot-street.—Visiting Gynæcologist.
Dudley, Guest Hospital and Eye Infirmary.—H.S. Also Asst. H.S. £175 and £150 respectively.
East London Hospital for Children, &c., Shadwell, E.—Asst. Surg.
Elizabeth Garrett Anderson Hospital, Euston-road.—Clin. Assts.
Exeter City.—Asst. M.O.H., &c. £600.
Exeter, Wonford House.—Jun. Asst. M.O. £300.
Frimley, Hospital for Consumption Sanatorium.—Sen. and Jun. H.P.'s. At rate of £150 and £100 respectively.
Halifax County Borough.—M.O.H. £1000.
Hampstead General and North-West London Hospital, Haverstock Hill, N.W.—Hon. Ophth. Surg.
Harefield, Middlesex, County Sanatorium.—Third Asst. Res. M.O. £400.
Hospital for Sick Children, Great Ormond-street, W.C.—H.P. and H.S. Each at rate of £100. Also Res. M.O. for Country Branch Hospital, Tadworth, Surrey. At rate of £250.
Hospital for Women, Soho-square, W.—Pathologist and Registrar. £100.
Huddersfield Royal Infirmary.—H.S. £150.
Hull, Royal Infirmary.—Second H.S. At rate of £150.
King's College Hospital, Denmark Hill, S.E.—Sister-Matron. Also Supernumerary Jun. Ophth. Surg.
L.C.C. Mental Hospitals Service.—Eighth Asst. M.O. £300.
[illegible] *St. James's Hospital.*—H.P. and S. £200.
[illegible] *Stepney Green, E.*—Hon. Asst. Phys.
[illegible] *emorial Jewish Hospital, Cheetham.*—[illegible] of £125.
Mildmay Mission Hospital, Austin-street, Bethnal Green, E.—Hon. Dental Surg.
Nottinghamshire County Council.—Tuberculosis Officer. £750.
Peterborough and District Memorial Hospital.—Hon. Asst. Surg.
Pontypridd, Llwynypia, Hospital.—Res. Asst. M.O. £300.
Portsmouth, Royal Portsmouth Hospital.—Sen. H.S. At rate of £200.
Reading, Royal Berkshire Hospital.—Pathologist, &c. £750. Also Third H.S. and Res. Anæsthetist. At rate of £150.
Royal College of Surgeons of England.—Election to Court of Examiners.
Royal Free Hospital, Gray's Inn-road, W.C.—Res. H.S.'s and Res. H.P.'s. Each £150. Surg. Reg. £200. Gyn. Reg. and Med. Reg. Each £100.
Royal Northern Hospital, Holloway, N.—Out-patient M.O. Also H.S. At rate of £125 and £70 respectively.
St. Marylebone Hospital, Ladbroke-grove, W.—Third Asst. M.O. £300.
St. Ma [illegible] *Women, &c., Plaistow, E.*—Hon. Asst. P.
Sheffiel [illegible] —Res. M.O. £150.
Sheffiel [illegible] Pathologist. £500.
Sheffiel [illegible] Pathologist, &c. £500.
South [illegible] *n, South Side, Clapham, S.W.*—Clin. Asst. 1 guinea per attendance.
Swansea Hospital.—H.S. £150.
Walsall General Hospital.—H.S. At rate of £125.
Warrington Infirmary and Dispensary.—Sen. H.S. £300.
West London Hospital, Hammersmith-road, W.—H.P., H.S. Also Aural and Ophth H.S. Each at rate of £100.
Winchester, Royal Hampshire County Hospital.—H.P. £150.
Worcestershire County Council.—Asst. County M.O. £600.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Carnwath (Lanarkshire) and Bruton (Somerset).

Births, Marriages, and Deaths.

BIRTHS.

BROWNE.—On Nov. 1st, at Welbeck-street, W., the wife of Denis Browne, F.R.C.S., of a daughter.
NEWMARCH.—On Nov. 1st, to Gwendoline, the wife of Dr. J. H. Newmarch, of Evelyn-gardens, S.W., of a daughter.
SPERO.—On Nov. 2nd, at Lancaster Gate-terrace, W., the wife of Dr. G. E. Spero, of a daughter.

MARRIAGES.

COLLEN—COOPER.—On Oct. 31st, at Brighton, Edward Victor Collen, B.A., M.D., to Celia Phyllis, younger daughter of the late Sir Pope Cooper, K.C.M.G., Chief Justice of Queensland.
YOUNG—BUCKLE.—On Oct. 27th, at Norbiton, Surrey, Matthew Young, M.D., to Mary Gladys Buckle.

DEATHS.

BROADBENT.—On Nov. 2nd, suddenly, at Cambridge, Reginald Broadbent, M.D., of West Parade, Bexhill.
MOORHEAD.—On Oct. 28th, at Harrow, James Herbert Moorhead, M.D., of Sunnyside, Raglan-road, Smethwick, aged 55 years.
PAULING.—On Oct. 30th, at Ashley-gardens, S.W., William Tennant Pauling, M.R.C.S., L.R.C.P., aged 61.
SELBY.—On Oct. 31st, at 16, Sunderland-terrace, W. 2, Peggy, the loving and much loved only child of the late Major R. Selby, R.A.M.C., and Mrs. Selby, after a long and painful illness borne with exemplary patience. Funeral at Lansdowne, Bath. We asked life and Thou gavest it to her.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

A BROADCAST TALK ON THE ULTRA-VIOLET RAYS.

Given from the London Wireless Station on Nov. 7th by

SIDNEY RUSS, D.Sc.,
PROFESSOR OF PHYSICS, MIDDLESEX HOSPITAL MEDICAL SCHOOL.

ULTRA-VIOLET rays were discovered as long ago as 1800, but it is only comparatively recently that people other than scientists have taken much interest in them. But to get back to the beginning of the subject one has to go back as far as 1666, when Isaac Newton made his famous experiment. He let a beam of sunlight pass through a glass prism and found that this beam was apparently split into a lot of different rays, which are now known as the spectral colours.

Newton's experiment may be arranged so that the rays emerging from the prism fall on a white screen and the band of different coloured lights, ranging from red at one end to violet at the other, can be carefully examined. Between the red and violet are the bands of orange, yellow, green, blue, and indigo.

There is no definite point where the violet light stops, as some people can see a little further than others in the region of light, but no one can see any colour beyond a certain limit, and this is where the ultra-violet rays begin.

These rays are normally present in sunlight, but, as they are invisible, Newton did not detect them. Although they cannot be seen, they have a profound effect on many things; photographic plates, for instance, are much more sensitive to ultra-violet rays than to ordinary light; in fact, the discovery of ultra-violet rays was due to their chemical action. These changes are not only of great interest and importance in the study of chemistry, but also in agriculture and medicine.

The use of ultra-violet rays in medicine is often called actinotherapy, and, although this is a new name, it is not entirely a new method of treatment; in fact, it is one of the oldest. There is historical evidence that 3000 years ago the healing powers of sunlight were appreciated to some extent, and there are definite records that the ancient Egyptians, Greeks, and Romans used it as a curative agent.

Ultra-violet rays, which are one of the invisible parts of sunlight, are showered out by the sun and reach the earth in the same way as light does.

Although there is not much apparent difference on a sunny day between the sun*light* in a valley and on a mountain top 10,000 feet up, there is a great difference in the amount of ultra-violet rays reaching the two places, because 10,000 feet of air will absorb quite a large amount of these rays, especially if the air is dusty. In this way sunlight in large smoky cities is robbed of nearly all its ultra-violet. It is chiefly these rays which tan the skin, and during the coal strike in 1921, when very little fuel was burnt in open hearths, there were unmistakable signs of tanned faces among the London population, a phenomenon probably not witnessed for hundreds of years.

The ordinary artificial sources of light, either candle, lamp, gas burner, or electric bulb, do not give out much ultra-violet radiation. The best way to produce these rays artificially in any quantity is to use some sort of arc lamp, either one open to the air, like the ordinary carbon arcs used for street lighting, or a closed mercury-vapour lamp. The ultra-violet rays can be separated from light by the simple process of filtering; the screen or filter used is a special kind of glass, invented by Prof. Wood, of America, which lets through the invisible rays but stops the visible ones. This glass makes it possible for us to see what things look like with ultra-violet rays only shining on them, if it is permissible to use the word "shining." Though the rays are quite invisible they can make things light up when they fall on them, giving them a rather weird and wonderful appearance.

In the Natural Science Museum at South Kensington an exhibit has been installed showing the appearance of a number of minerals in ordinary light and under ultra-violet rays: the difference revealed is amazing. Many insects, too, show similar contrasts. Our sense of wonder is rather quickened at the thought that the dim lit night hours (which are not devoid of ultra-violet rays) may be for the more seeing world not darkness at all, but simply a change of setting, where objects inconspicuous in blazing sunlight stand out conspicuously as they transform into light the ultra-violet rays which fall on them.

If people are examined under ultra-violet rays they bear very little resemblance to their normal daylight appearance; their faces look rather like alabaster with bright

spots here and there, their hair loses all the lustre and looks something like straw, their teeth are glaringly white unless they are artificial, in which case they appear quite black. The appearance of the eyes is curiously striking, for the ordinary colouring hardly shows, but the clear covering of the eye and lens are seen to glow with a pale lavender colour which gives a weird appearance. The portrait outlined is not a very becoming one but it is full of interest, showing as it does the many different ways in which the tissues of the body respond or react to these rays.

The whole of vegetable life is directly or indirectly dependent on sunlight; and growth, which is a series of such very complicated processes, is one of the problems which chemists at the present time are trying to unravel. Prof. Baly, of Liverpool University, has found that sugar can be formed from comparatively simple compounds by the action of ultra-violet rays. Some of the vitamins about which so much is heard to-day, and which appear to be essential for our well-being, are also affected or produced by these rays. A deficiency of one of these vitamins in the diet of children gives rise to rickets. A study of the disease in the years following the war showed that, if children were given suitable doses of ultra-violet rays, they did not develop rickets even when they were fed on a diet so deficient that they would ordinarily be pretty sure to get the disease. The conclusion was naturally drawn that the vitamin was somehow produced by the rays acting on the body, although this seemed hard to believe, as ultra-violet rays scarcely penetrate through the skin. So the only possible inference seemed that the vitamin was produced by the action of the rays on something in the skin, which was then set free in the body, and so affected the general well-being of the child. This view is now generally held, and it is no exaggeration to say that the children are literally nourished by sunlight and that ultra-violet rays play some part in the process.

These rays began to be used medically in 1893 by Finsen at Copenhagen, and the splendid institute there which bears his name is a tribute to the memory of a man who died of tuberculosis, yet was able to cure the disease in certain forms in others.

In *Alpine sanatoria*, where patients get the benefits of the pure bracing mountain air, Finsen's ultra-violet methods are still used with some modifications. The whole body is gradually exposed to the sun's rays until the skin has become quite tanned by the exposures. In England, too, at Alton and Hayling Island, at the institutions begun by the late Sir William Treloar and organised by Sir Henry Gauvain, wonderful examples of the benefits which can be derived from life in sunshine and the open air may be seen. For many months in the year when there is so little sunshine it is necessary to use artificial sources of light and ultra-violet rays for the treatment of disease, and gradually the term "artificial sunlight" has crept into use.

The suggestion has been made in various quarters that normal healthy people should have doses of this so-called "artificial sunlight" in the dull months of the year. Why should not it be installed in our houses so that we may enjoy something like sunshine when we cannot have the real thing? Judging by the statements made during the last five years this must have been done to some extent, and many people are using these rays at their own discretion. It may be useful to remind them that these lamps are not really artificial producers of true sunlight, and that they give out rays which may turn out to be harmful in their action in some ways instead of entirely beneficial as is now generally supposed.

At the present time our knowledge of the action of ultra-violet rays is very incomplete, and it seems a very unwise policy for people to use them, either upon themselves or their children, except under proper medical supervision. Otherwise we are faced with the fact that an experiment on a very big scale is being undertaken without any direct medical control.

Extensive use of the valuable properties of these rays in the treatment of disease is being made by medical experts, but the normally healthy individual is probably better off if he enjoys real sunshine when he can get it than if he experiments with the artificial variety.

ROYAL ALEXANDRA HOSPITAL FOR SICK CHILDREN.

On Oct. 31st, the ultra-violet light department and new operating theatre of this hospital at Brighton were inaugurated, an event which marked the completion of the new wing which was formally opened in May last by the Duke and Duchess of York. Originally, the hospital possessed only one ultra-violet lamp, but it has now five; and together with a self-contained flat for the resident medical staff, the institution may be said to have been brought thoroughly up to date. The cost of the new wing has been about £12,000.

SELECTION OF TRAM AND 'BUS DRIVERS.

THE industrial psychologist now has his part to play in the prevention of traffic accidents. The Director of the Laboratory of Experimental Psychology at the Practical School of Higher Studies, attached to the Sorbonne, Paris, has recently published the results of several years' study of the psycho-physiological selection of Paris tram and 'bus drivers.[1] In 1921 he was appointed by the Paris General Transport Company (which runs all the 'buses, trams, and Seine steamers) to examine and select all their personnel, numbering about 30,000. Before the laboratory was established, 20 per cent. of the drivers were found to be unsuitable either during or after their apprenticeship. Since the tests have been made, the proportion of failures has fallen to 3·4 per cent. The number of accidents to selected drivers during their first year's service has been 16·5 per cent. less than those happening to unselected drivers.

Candidates are first examined medically and then psychotechnically. The various apparatus and processes employed cannot be described here, but the technician will find them in Mr. Lahy's book. One of the most important tests, named the "diffused attention" test, aims at measuring the candidate's ability to take quick decisions amid the sights and sounds of a crowded street. Another measures the "emotivity" of the subject, in view of the fact that these accidents are often caused by nervous injuries due to or connected with some previous accident. It seems but a short step from the tram or 'bus driver to the chauffeur, amateur or professional. We know of no country yet where a psychological examination is made of would-be chauffeurs, though the majority oblige them to pass a mechanical test before they receive their licence. The increase in the number of street accidents in London, Paris, and New York of recent years has been appalling. If the industrial psychologist can reduce such accidents, his help should be welcomed both by chauffeurs and pedestrians.

A HALFPENNY NEWSPAPER FOR DOCTORS.

THE *Siècle Médical*,[2] which is "exclusively reserved to the corps médical," has been on sale regularly every fortnight in Paris during the last two years for 20 centimes, rather less than one halfpenny. It is safe to say that such a venture could have succeeded only under powerful auspices, and inquiry reveals that the *Matin* is the father of this promising child, who has embraced the medical profession from his cradle. In size and appearance the *Siècle Médical* is not attractive: it contains half a dozen sheets of cheap paper, printed with evil-smelling ink, and dotted about with unflattering portraits of medical experts. Its contents, however, are distinctly valuable. It really is a newspaper, not a medical journal, and almost every item would be acknowledged by a professional journalist to have "news value" for its readers. The front page is mainly given over to accounts of medical and public health congresses. Other contributions are reports of scientific societies, new items relating to medicine from the provinces and abroad, a medical bibliography, a dental page, a literary page, a wireless column, and a page for the medical motorist. A formal notice is published in each number that the *Siècle Médical* accepts no advertisements of pharmaceutical specialties addressed directly to the public. It reserves the right of refusing any advertisement, the text or object of which appears doubtful to it, or which does not live up to the standard of its readers. The majority of the advertisements printed relate to objects of daily use, but some advertise laboratory preparations and surgical supplies.

A POCKET MEDICAL DICTIONARY.

THE pocket edition of Gould's Medical Dictionary has reached its ninth issue (London: H. K. Lewis and Co., Ltd. Price 10s.). This little book, which may be carried comfortably in the coat pocket, measures 6¼ in. by 3¼ in., and in its unnumbered pages contains over 40,000 words used in medicine and the collateral sciences, with the proper pronunciation and a short definition. Some months of use are necessary to test the qualities of such a book, and as a French writer once remarked: "Le meilleur dictionnaire est celui qui est le moins mauvais." The errors are in fact very few indeed, but V stands for Vanadium and not Vanadium, while a Megohm is a million ohms and not one-millionth part of an ohm. It is almost too late to say that vitamins are "unknown substances"; quite a lot is now known about them. We are glad to see "Apple Head: A term for the broad, thick skull of dwarfs"; even some big dictionaries do not give this. "Pocket Gould" in its revised form is a safe and useful companion for any practitioner or student of medicine.

[1] La sélection psychophysiologique des travailleurs-conducteurs de tramways et d'autobus. 1 Vol. Pp. 240. Fr. 18. Dunod, rue Bonaparte, Paris, &c.

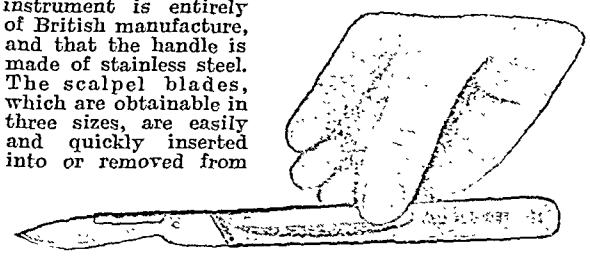
[2] Le Siècle Médical. 10, Boulevard Poissonnière, Paris. Bimensuel.

JEAN FRANCOIS COSTE.

Dr. Jean François Coste, chief physician to the French Army under Rochambeau which came to the assistance of the United States against England in the War of the Revolution, is recalled by Dr. J. E. Lane, of New Haven, Connecticut, in the *Military Surgeon* for August. Born in France in 1741, near the Lake of Geneva, he was the son of a physician, and was educated at Lyons and Paris. He met Voltaire at Ferney where he did such good work in an epidemic that Voltaire introduced him to the Prime Minister, Choiseul, who sent him to Nancy, and later to Calais. Thence he was appointed, in 1780, to Rochambeau's army, and leaving Brest on April 12th he arrived at Newport on July 11th—three months later. In America he published a pharmacopœia for the use of the hospitals; "the simpler the art of medicine," he said, "the more it is truly rich." Patients in the French hospitals were reported very neat and clean, though they did not recover better than the Americans. The French troops had good health, and Coste was thanked by Washington for what he did for the American hospitals. Returning to France he was moved from Calais to Versailles, becoming chief physician of camps and armies at the War Office. In 1790 he was appointed the first mayor of Versailles; "active, kind, and fatherly," he sought work for the people and kept the town quiet through the troubles of the time: no small success. His portrait hangs in the Hôtel-de-Ville, and shows a round face, high forehead, firm mouth, and deep-set eyes, with a kind and shrewd expression. He kept his head through the Terror, served on the health committee of the National Assembly, and went to the wars again with Napoleon till relieved of field duty in 1809, at the age of 68. He died in Paris ten years later, as chief physician of the Invalides. He had always stood up for the soldiers, and would not have economies made to their disadvantage. He was a physician, says Dr. Lane, "of ability and high character, whose long life was devoted to faithful and courageous service."

THE "A. & H." KNIFE.

THE new form of surgical knife with interchangeable blades here illustrated, is made by Messrs. Allen and Hanburys, Ltd., of 48, Wigmore-street, London, W.1, who state that the instrument is entirely of British manufacture, and that the handle is made of stainless steel. The scalpel blades, which are obtainable in three sizes, are easily and quickly inserted into or removed from



the handle, a slot and a pin being the means of attachment. The advantage of always having a sharp blade ready is, of course, obvious.

RADIOLOGY IN DENTISTRY.

THE Dental Board of the United Kingdom has published a series of four lectures delivered under their auspices last year. These lectures were: (1) The Physics of Radiology, given by Mr. G. W. C. Kaye, D.Sc.; (2) Instruments, Apparatus, and Radiographic Technique, by the late Dr. Robert Knox; (3) the Interpretation of Dental Skiagrams, by Dr. H. M. Worth; and (4) Ultra-violet Ray Treatment, by Dr. Leonard Hill. The object of the Dental Board in arranging these lectures has been to further post-graduate study. The lectures are not elementary; indeed, those who approach the subjects without some preliminary knowledge will find them rather advanced. On the purely radiographic side, highly instructive material is collected and nice judgment has been used in the choice of radiograms. Whether a collection of lectures of this sort will serve the radiographic needs of dentists quite as well as a systematic course, including practical instruction, is doubtful. Such a course would be an impossibility for many dentists, and the lectures here presented in one volume form a good substitute.

CENTENARY OF BIRKENHEAD GENERAL HOSPITAL.

THIS hospital began in 1828 as a dispensary in a small house provided by Mr. John Laird, the founder of the firm of Cammell, Laird and Co. In 1845 a new building was erected on a site given by Mr. Laird, and renamed the Birkenhead Hospital and Dispensary, and contained eight beds and two cots. The increase of population soon made it inadequate, and in 1862 Mr. Laird built a new hospital of 50 beds at his own cost upon a site given by Mr. Thomas Brassey, the contractor. The building, then called the Birkenhead Borough Hospital, was enlarged in 1882; in 1901 another ward was added; there were further extensions in consequence of the War, and in 1926 the title was changed to the Birkenhead General Hospital. There are now 156 beds, and it is hoped to raise a centenary fund of £20,000 to open free from debt the new out-patients' department now being built. The *Birkenhead Advertiser* has issued an illustrated supplement detailing the history of the institution.

A NEW VENTILATING SYSTEM.

A DEMONSTRATION was recently given in London of a new ventilating system known as Anemostat, the essential feature of which is a spreader, enabling the air passing along a duct at high velocity to be introduced into a room at a uniform low velocity. By means of this device the air in a room may be changed as often as 10 to 15 times an hour without any sensation of draught, and with high efficiency, the loss of power at the spreader being negligible. Other devices of the ventilating system are dust separators of a simple but efficient type, washing apparatus for removing gases, vapours, and organisms from the air and permitting recovery of valuable or dangerous by-products. It is claimed that 90 to 99 per cent. of the organisms present in the incoming air can be removed. Arrangements are also provided for heating, cooling, humidifying, or drying the air so that it may be delivered at any desired temperature or humidity, as well as practically free from organisms and even the finest dust. The spray diffuser for humidifying can also be used for introducing disinfectants or therapeutic agents. It is stated that the sprayer breaks one gallon of water into over eleven million parts, the resulting mist being so fine and light that it penetrates to the smallest alveoli. The apparatus is handled in this country by Anemostat, Ltd., London.

ST. THOMAS'S HOSPITAL DINNER.

IN an account of this dinner on p. 952 of our last issue one of the speeches was attributed to Mr. G. Q. Roberts, late secretary of the hospital, who is at present in East Africa. The name of the speaker should have been given as Mr. George Roberts, and he is one of the senior almoners.

AN IMPROVED ATTACHMENT FOR ARTIFICIAL LIMBS.

OUR attention has been called to a new form of body-belt for the attachment of artificial legs. The advantages claimed for it are that the use of shoulder-straps is obviated, and in many cases the provision of a hip-joint and pelvic band for short stumps is rendered unnecessary. The belt is attached to the artificial limb by straps which hold it firmly in place on the stump, while freedom of movement is obtained whether sitting (there is no inconvenient strap directly at the back of the belt), standing, or walking. The wearer can extend the leg backward or forward, or move it from right to left without fear of displacement, while the two knees can be brought together or kept apart with ease. The makers are Messrs. W. R. Grossmith, Ltd., 12, Burleigh-street, Strand, London, W.C. 2, who will supply further particulars and demonstrate the appliance to any member of the medical profession.

"*Overcrowding at Sheffield Infirmary.*"—In regard to a note under this heading in our issue of Oct. 27th, we are asked to state that the institution referred to is not the Royal Infirmary, Sheffield. "Through the long history of the institution it can truthfully be said," writes the general superintendent and secretary, "that two patients have never been placed in one bed."

THE LANCET: SUBSCRIPTION RATES.

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A CLINICAL AND BIOCHEMICAL

Study

OF

ALLERGY.

BY H. W. BARBER, M.B. CAMB., F.R.C.P. LOND.,
PHYSICIAN IN CHARGE OF THE SKIN DEPARTMENT, GUY'S HOSPITAL;

AND

G. H. ORIEL, M.D. CAMB.,
ANDERSON DEMONSTRATOR OF CLINICAL CHEMISTRY AND PARSON'S RESEARCH SCHOLAR, GUY'S HOSPITAL.

I.

THE word "allergy," as originally employed by Pirquet,[1] has really a narrower application than others have given to it, for, as Darier[2] points out, although it includes all forms of acquired hypersensitiveness, it excludes inborn hypersensitiveness or idiosyncrasy. This distinction, however, is hardly of practical importance or, indeed, valid, and with Doerr, Zinsser, Wells, Duke,[3] and others we use the term in its wider sense to indicate almost all forms of hypersensitiveness. Moreover, we regard as profitless the discussions that have arisen as to whether or not the so-called allergic conditions, such as hay-fever, asthma, and urticaria, should be regarded as anaphylactic reactions or whether they differ essentially from true anaphylaxis, as produced experimentally in animals or as it may occur accidentally in man. Lewis[4] says:—

"It is not universally accepted that this phenomenon (protein sensitivity) is identical with the anaphylactic reactions that have become models in animal experiment, though it is certainly not to be doubted that it holds much in common with the latter."

The important fact is that many of the clinical symptoms to which sensitised persons are liable are identical with those seen in animals with anaphylactic shock—for example, contraction of the pilo-motor muscles with erection of the hair follicles, paroxysms of sneezing and coughing, pruritus, urticaria, respiratory distress consequent upon the contraction of the smooth muscle of the bronchioles and œdema of the bronchial mucous membrane, vomiting, diarrhœa, diuresis, and epileptiform convulsions. The following list includes the majority of symptoms which are certainly or probably of allergic origin:—

Cutaneous.—Urticaria; true infantile eczema; certain forms of eczema occurring after infancy; certain forms of pruritus; prurigo of the Besnier type; prurigo of the Hebra type; prurigo of the simple type; prurigo nodularis; urticaria papulosa (lichen urticatus, strophulus); light-sensitisation of the adult type; dermatitis herpetiformis (probably).

Subcutaneous.—Angeioneurotic œdema.

Respiratory.—Paroxysmal rhinitis, of which hay fever is one of the commonest examples; asthma.

Gastro-intestinal.—Certain forms of vomiting and diarrhœa; cyclical vomiting.

Nervous.—Migraine; epilepsy (probably).

Articular.—Paroxysmal hydrarthrosis.

This list, although it may appear formidable, is doubtless incomplete. Freeman[5] includes functional albuminuria and—tentatively—dermographia and paroxysmal colitis. Cases have been recorded in which functional albuminuria ceased when certain articles of food—e.g., milk—were excluded from the dietary. We are tempted also, with Freeman, to include ichthyosis, since, as has been pointed out by one of us,[6] it is so commonly seen in those patients who from earliest childhood manifest concurrently or in succession multiple symptoms of the allergic state. Many of them have such characteristic physical and psychical attributes, and exhibit a syndrome of symptoms so constantly, that one is justified in classing them as a type apart. Indeed the practised eye will recognise a person belonging to this type at a glance; he represents the allergic subject par excellence. The cardinal symptoms comprising the syndrome are: Besnier's prurigo, asthma, and eczema; a considerable proportion of the patients are ichthyotics, and other allergic symptoms, such as urticaria, angeioneurotic œdema (an unnecessary term, since it is merely a subcutaneous form of urticaria), and hay-fever may occur. The great majority have suffered from true infantile eczema, which may be preceded by ichthyotic dryness of the skin; at about the age of two years the infantile eczema merges into the prurigo of Besnier, though the latter may develop without a previous eczema and may even occur for the first time in adolescence; sooner or later asthmatic symptoms—usually diagnosed at first as "bronchitis" or "broncho-pneumonia"—appear, and paroxysmal rhinorrhœa and urticaria are not uncommon. It is in patients of this type that well-marked positive cutaneous reactions are obtained with various foreign proteins, and multiple positive tests are the rule. To cite but one example:—

CASE 1.—A man aged 42; family history of eczema; ichthyosis on the father's side. Had infantile eczema. Asthma began at the age of 2 years. Asthma and irritation of the skin provoked by contact with horses and cows; also asthma with catarrhal infections. Severe urticaria and angeioneurotic œdema from brazil nut, which once nearly caused death from œdema of the glottis, when taken accidentally. Has ichthyosis and prurigo of the Besnier type in antecubital fossæ, popliteal spaces, wrists, and face. Cutaneous tests: horse +++; cattle +; dog +; sheep +; brazil-nut +++.

Definition of Prurigo.

Although many dermatologists will doubtless disagree with us, we employ, with Darier,[7] the term *pruritus* as a synonym of itching, and *prurigo* to indicate certain definite changes that take place in the skin as a result of a long-continued pruritus and consequent rubbing and scratching. Not every person, however, with pruritus, even of long-standing, necessarily develops prurigo. The changes that actually occur in the skin differ somewhat in the various forms of prurigo; they comprise (1) the prurigo papule or nodule, (2) the characteristic modification of the appearances and structure of the skin termed by Besnier *lichenisation*, and described in minute detail by Brocq[8] as *lichenification*. In some clinical varieties of prurigo the papules predominate, in others lichenification, but both types of lesion are often present in the same case. The chief varieties of prurigo may be classified as follows:—

1. *Prurigo simplex acutus:* Urticarial wheals with central papules.—Syn: Urticaria papulosa (Kaposi, Duhring, Crocker); lichen urticatus (Bateman); lichen simplex acutus (Vidal); strophulus pruriginosus (Hardy); prurigo infantilis (Hutchinson, Pye-Smith).
2. *Prurigo simplex:* Lichenification.—Syn: Névrodermite (Brocq), (*a*) circumscribed form (syn. lichen simplex chronicus (Vidal), and (*b*) diffuse form.
3. *Prurigo of Besnier* (Rasch): Lichenification.—Syn: Prurigo-asthme (Sabouraud).
4. *Prurigo of Hebra:* Papules with some lichenification.
5. *Prurigo nodularis:* Nodules.

The prurigo of Besnier is a definite entity. Besnier,[9] in his original description, termed it "prurigo diasthésique." He emphasised the following features: (1) the violence and paroxysmal nature of the itching, the paroxysm being usually nocturnal and the intensity often subject to seasonal variations; (2) the localisation to the joint flexures, the skin in these situations becoming lichenified, with moisture and fissuring during the more intense paroxysms of itching; (3) the coexistence of asthma, hay-fever, and gastro-intestinal disturbances; (4) the chronicity of the condition and its resistance to treatment.

Hodara[10] in 1902 described a number of cases, with a detailed analysis of the various elementary lesions and the clinical forms of eruption that may be met, but it is doubtful whether all his cases were genuine Besnier's prurigo. Rasch[11] has given one of the best descriptions of the condition. He had previously referred to it in his book on diseases of the skin (1903), and he was the first to suggest the term

"prurigo of Besnier." He emphasises the following points:—

1. The familial incidence. (Although we have met with it in more than one member of a family it is far commoner to find other allergic manifestations—e.g., infantile eczema, asthma, hay-fever, urticaria, lichen urticatus, migraine, &c.—in the parents and their near relatives, or in other members of the same generation.)
2. The onset in early childhood (it frequently, of course, follows infantile eczema) much more rarely at or after puberty.
3. The intensity of the itching and its nightly exacerbation (nocturnal paroxysms are the rule in allergic conditions).
4. The extreme chronicity and resistance to treatment.
5. The coincidence of asthma, which usually accompanies the paroxysms of itching, rarely alternates with them.
6. Its occurrence in nervous, pale, restless children.
7. In adults its occasional coexistence with light sensitisation.
8. Its clinical distinction from the true prurigo of Hebra, which spares exactly those situations most affected in Besnier's prurigo—viz., the flexures of the joints, the neck, and the face. Rasch points out that the latter was really first described in 1884, eight years before Besnier published his original observations, by Hans Hebra as "dermatomycosis diffusa flexurarum," although he wrongly ascribed to it a mycotic origin. Strictly speaking, therefore, it should be known as the "prurigo of Hans Hebra," but, since his father's name has been given to another form of prurigo, confusion might arise.
9. The therapeutic effect of a strict lacto-vegetarian diet. (This point will be referred to later; it is one of very great importance in relation to our researches into the ætiology of the condition.)

Sabouraud[12] gives a clinical description of Besnier's prurigo in its association with asthma, labelling it "le prurigo-asthme."

Recently Haxthausen[13] has contributed an important article in which he briefly surveys the literature and records some observations of his own in a series of 38 cases, 24 of which were males.

He remarks that the influence of heredity was not very apparent in his patients, but this was doubtless because he did not realise that Besnier's prurigo is merely one of numerous manifestations of the allergic state. Seven of his cases were asthmatics and seven ichthyotics, but it did not appear that ichthyosis was more frequent in the asthmatics than in the others. One patient also had hay-fever, and during the hay-fever period the cutaneous lesions disappeared. Haxthausen observed that practically all his patients recovered in hospital on a lacto-vegetarian diet combined with suitable local treatment, and there were never any sudden exacerbations or remissions so long as the patient remained in hospital; they usually occurred, however, as soon as he returned to his normal life. This, as every clinician is aware, is characteristic of allergic conditions. Haxthausen, however, quotes one case—a young man with asthma and Besnier's prurigo—who was admitted to a dermatological clinic and placed on a strict lacto-vegetarian diet; in a few weeks both the asthma and prurigo disappeared. But on removal to an ordinary medical ward for treatment of his asthma he was given the usual full diet, with the result that his symptoms returned, only to disappear again when the lacto-vegetarian régime was renewed. With this in mind Haxthausen proceeded to perform cutaneous tests with various proteins—food substances, animal pellicles, bird feathers, plant seeds, and pollen, &c.—in a series of 15 of his cases; 12, or 80 per cent., gave positive reactions. In ten cases multiple reactions were obtained. All the asthmatic cases (3) and one hay-fever patient gave strongly positive tests. Patients with other dermatoses were also tested similarly; apart from slightly positive reactions in a few cases of chronic urticaria and lichen urticatus, the only other condition which gave well-marked positive tests was infantile eczema (4 cases out of 11). An attempt was made to determine a relationship between the prurigo and the substances to which the patients reacted, with some apparent success.

Baagoe[14] has also published an article on Besnier's Prurigo in Asthma, in which he records 15 cases of Besnier's prurigo, 13 of which were also themselves asthmatic, one was the brother of an asthmatical subject, and one the child of an asthmatical parent. Six of these cases were also ichthyotic, and 11 had previously had infantile eczema. In a few cases there was also lichen urticatus, or ordinary urticaria due to food sensitiveness. Cutaneous tests were performed in 14 of these cases, and some positive reactions were obtained in all. He concludes that Besnier's prurigo, like asthma and urticaria, is an anaphylactic phenomenon.

All these observers recognise Besnier's prurigo as a definite clinical entity, distinct from Hebra's prurigo which has a different distribution, involving the extensor surfaces and sparing the joint flexures and face, the parts most commonly affected in Besnier's prurigo. Brocq unfortunately confuses matters by referring to the latter as "prurigo dit de Hebra, variété française," and in his Cliniques Dermatologiques he there describes and illustrates a typical example of Besnier's prurigo in a child, affected also with asthma and bronchitis. Veryrières et Jumon,[15] in an article entitled "L'asthme infantile intrigué de dermatoses prurigineuses," divide the cutaneous manifestations that accompany the asthma into "prurigo diathésique type Besnier" and "prurigo chronique vrai, forme atténuée de prurigo de Hebra"; they also remark that attacks of papular urticaria (strophulus) may precede the onset of the asthma. While recognising that in the prurigo of Besnier lichenification in the antecubital fossæ and popliteal spaces is characteristic, whereas in Hebra's prurigo it is the extensor surfaces of the limbs that are most affected, they nevertheless state that Brocq refers to the latter as "prurigo de Hebra à type français," but, as stated above, the case described by him under this title was unquestionably one of Besnier's prurigo.

We do not wish to labour the point unnecessarily, but we would insist that *clinically* the prurigo of Besnier and the prurigo of Hebra are entirely different, both as regards their localisation, the type of elementary lesion, and the *tout ensemble* of the fully developed eruption. The latter condition is much the rarer of the two. Both are unquestionably allergic in origin, and there are many points of resemblance between them, but they are nevertheless distinct morphologically and clinically, and should not be confused with each other. We would here emphasise two features which have not, perhaps, received the attention they deserve: pigmentation, and the erection of the pilo-sebaceous follicles on certain parts of the skin. They are not, of course, especially characteristic of Besnier's prurigo, but, on the contrary, are commonly seen in what may be called the prurigo group of eruptions; the simple papular prurigo, so frequently met with in adults, which involves particularly the neck and the extensor surfaces of the limbs; the prurigos of Besnier and Hebra; prurigo nodularis; dermatitis herpetiformis; light sensitisation of the adult type; and even urticaria papulosa, particularly when of the bullous type. In Besnier's prurigo the areas of lichenification are bordered by a zone of pigmentation, the hue and intensity of which vary according to the individual. In severe cases it is fawn-coloured and hardly distinct from the general sallow tint of the skin as a whole; in others, it is so deep a brown, particularly on the neck, as to recall that of Addison's disease. Apart, however, from the lichenified areas there may be increased pigmentation of practically the entire skin. There can be no question but that this pigmentation is due, like the erection of the pilo-sebaceous follicles and the prurigo itself, to involvement of the sympathetic or endocrine-sympathetic system. The erection of the pilo-sebaceous follicles ("goose-skin"), due to stimulation of the sympathetic fibres supplying the pilo-motor muscles, is one of the earliest cutaneous symptoms of the sensitised state, whether it be the skin itself that is sensitised (for example, to external irritants such as paraphenylenediamine or other chemicals) or whether the cutaneous response be part of a general systemic sensitisation—e.g., food poisoning, and drug intoxications, as from salvarsan or one of the gold-compounds. It is, perhaps, in cases of prurigo that the erection is most apparent. Jacquet[16] has insisted on the exaggerated contractility of the arrectores pilorum in prurigo, urticaria and some cases of eczema, and their actual hypertrophy in prurigo; this hypertrophy has also been described by Unna[17] in Hebra's prurigo.

We would also remark upon one very characteristic feature of the majority of allergic symptoms, namely, the influence upon them of psychical factors—e.g., annoyance, worry, emotion and nerve-exhaustion, and of the patient's surroundings. The susceptibility of an asthmatic to climatic and domiciliary changes is common knowledge, but the same holds good for other manifestations of the syndrome. Hallam[18] has rightly emphasised the fact that children with urticaria papulosa invariably lose the eruption in hospital, and that recurrence does not take place so long as they remain there. One of us (H. W. B.) recently admitted a boy to his ward with severe and typical prurigo of the Hebra type; the child entirely lost his itching, and the eruption cleared up after a week's sojourn in hospital, although no treatment of any kind was given. Within 12 hours of his return home the itching returned, and a week later the prurigo had become re-established. Under hospital conditions, too, an asthmatic often ceases to have attacks, but this is not constant. Children with infantile eczema or Besnier's prurigo also usually improve considerably, even without treatment, either dietetic, local or internal, only to relapse on their return home, but in them the effect of hospitalisation is not nearly so striking as in urticaria papulosa, Hebra's prurigo, or asthma. In adult patients with prurigo of the simple type we have often observed that a few days away from the worry of professional or domestic life, even though they eat and drink less carefully than at home, may lead to an entire cessation of itching. We will not discuss the explanation of this remarkable effect of hospitalisation or a change of surroundings, but, in view of what is to follow, we will merely point out that the improvement in the clinical condition is accompanied by a corresponding change towards the normal in the metabolism of the patient.

In the same way the influence of worry, domestic unhappiness and other psychical disturbances in precipitating the paroxysms of allergic symptoms is very striking; it reminds us that the part played by the vegetative nervous system, which is so susceptible not only to toxic substances of various kinds but also to psychical trauma, plays an essential rôle in the genesis of that highly complex phenomenon the allergic reaction. We must never lose sight of the fact that patients with a marked tendency to the development of allergic reactions have a psychical complex that is quite distinctive and that their vegetative nervous system, which controls their digestive and metabolic functions, is very easily disturbed, not only by bacterial infection, foreign proteins or protein derivatives and chemical poisons, but by fatigue or emotion as well.

BIOCHEMICAL INVESTIGATIONS.

One very significant fact may be emphasised at the outset, namely, that from the biochemical point of view the same essential cycle of events has been found to occur in all the allergic conditions so far investigated. There would seem, in fact, to be a "biochemical formula" common to all of them and, in spite of the differences in the actual clinical symptoms, the underlying metabolic changes are essentially *the same*.

Our studies are based on repeated examinations of the blood and of the urine, both during the phase of active symptoms and in periods of quiescence. We recognise a pre-paroxysmal, a paroxysmal, and a post-paroxysmal stage, and we are now able, merely from examination of the blood and urine, to state with considerable confidence in which stage the patient was when the given specimens were taken. The investigations were begun in order, if possible, to determine the part played by the liver in allergic conditions. The writings of Widal and his co-workers,[19] the researches of Manwaring[20] on experimental anaphylaxis, and, from the clinical standpoint, the views of Moncorgé[21] and others on the pathogenesis of asthma are well known. Since, however, in allergy one is dealing with protein sensitisation, one naturally seeks for disturbances of the hepatic function in protein metabolism. We shall not discuss the value or otherwise of the hæmoclasic-crisis test of Widal, Abrami, and Ivanesco. It has been studied, particularly by Brack,[22] in cases of prurigo and related conditions, and Wilson[23] states that it is positive in asthma, epilepsy, and certain infections. Shaw,[24] however, concludes that, so far as the leucocyte count is concerned, "the hæmoclasic test lacks a theoretical basis, and in practice is of no value in the diagnosis of hepatic insufficiency." Marcel Labbé[25] considers that the study of the amino-acid excretion in the urine is one of the most reliable tests of hepatic function. Under normal conditions it is small and varies according to the dietary, being practically nil on a strict vegetarian régime. Hyperaminoaciduria is met with particularly in hepatic disease—e.g., in alcoholic cirrhosis. Labbé and Bith[26] have also shown that it occurs in diabetes with acidosis, but it is only indirectly an indication of acidosis. It is merely a sign of the diabetic disturbance of nitrogenous metabolism.

Numerous tests have been devised for investigating the various and important functions of the liver, and for a detailed and comprehensive analysis of the methods employed we would refer to the classical monograph of Noël Fiessenger and Walter.[27] For our purpose it seemed reasonable to suppose that the estimation of the amino-acid content of the blood might afford a reliable index to the efficiency or otherwise of the liver in protein metabolism. For this Folin's[28] colorimetric method was employed, using sodium β-naphthoquinone-sulphonic acid as reagent.

It appears, from our investigations and from those of others, that the average normal figure for the amino-acid content of the blood is from 4·0 to 6·5 mg. per 100 c.cm., the latter figure being distinctly a "high-normal." In order to determine the effect of a meal containing plenty of protein, "protein-tolerance tests" were performed in normal subjects and in those with allergic symptoms. A determination of the amino-acid content of the blood was made before breakfast or several hours after a meal, and a mixed meal containing various proteins was then given and estimations made one, two, and three hours afterwards, e.g.:—

CASE 2.—Normal subject. Before breakfast 3·7 mg. per 100 c.cm.; one hour after breakfast 4·7 mg., which figure remained constant two and three hours afterwards.

CASE 3.—Normal subject. 5·0 mg. before a meal; 5·8 mg. afterwards.

CASE 4.—Normal. 4·0 mg. before; 5·6 mg. afterwards.

CASE 5.—Case of dermographism and urticaria. 5·0 mg. before a meal; one hour afterwards 5·5 mg.; two hours afterwards 6·2 mg., when there was slight urticaria; three hours afterwards 5·8 mg., when the urticaria had disappeared.

CASE 6.—Case of asthma and prurigo. Fasting 7·0 mg.; one hour after meal 7·2 mg.; two hours after 7·4 mg.; three hours after 7·2 mg.

There is, therefore, a slight temporary rise in the amino-acid content of the blood after a protein meal, both in normal subjects and in others. A large number of estimations have been carried out in patients with allergic manifestations, the majority of cases investigated being classical examples of the asthma—hay-fever, eczema, prurigo syndrome; in a considerable proportion more than one of these various symptoms were present. In this group, which for brevity's sake we will term the asthma-prurigo group, a high amino-acid content of the blood was found to be constant in untreated cases, with this reservation: the patients were seen as a rule when one or other of their symptoms, usually prurigo, were active. Normal figures may be obtained after dietetic and other treatment, and probably also during the remissions that occur so often and so inexplicably in these patients.

CASE 7.—A man of 35, an ichthyotic, with a family history of asthma and migraine, suffered from infantile eczema and later asthma and prurigo of the Besnier type. In December, 1927, he was having moderately severe

asthmatic attacks, with nocturnal exacerbations of itching. The amino-acid content of the blood drawn in the afternoon—a period of quiescence—was 7·0 mg. per 100 c.cm. After a fortnight's dietetic and other treatment he was free from asthma and itching. The amino-acid figure was 5·8—i.e., normal. Treatment was suspended, and he returned in January, 1928, having had slight asthma and itching; amino-acid figure 7·0. Early in March he had a severe relapse after a gastro-intestinal upset; amino-acid figure 9·3. Treatment again instituted; at the end of a fortnight marked improvement; amino-acid figure 7·0.

It is our impression that in cases of Besnier's prurigo, with or without asthma, the amino-acid content of the blood tends to be high, even during periods of comparative freedom from itching. Thus Case 1, with ichthyosis, asthma, Besnier's prurigo and urticaria, and multiple sensitisation to horse and other animals and to brazil-nut, nevertheless had an amino-acid figure of 9·8 during a period of almost complete absence of symptoms.

CASE 8.—A little boy with Besnier's prurigo and formerly infantile eczema and asthma had an amino-acid figure of 8·2 at a time when the prurigo was slight.

CASE 9.—A little girl with asthma, hay-fever, horse sensitiveness, eczema, prurigo, and urticaria was seen during one of her best periods, when she was having no asthma and only slight itching; the amino-acid figure was 9·3.

Of 41 patients belonging to this group, in nearly all of whom there was a combination of asthma or hay-fever with prurigo of the Besnier type and several of whom were ichthyotics, the average figure for the amino-acid content of the blood was 8·8. The highest figure in this series was 11·0, the lowest 7·0. In 13 cases of urticaria the average amino-acid figure was 7·8. In some of these the examination was made during the active, in others during a quiescent stage. In some cases of urticaria and of asthma without prurigo the amino-acid figure may be normal, or nearly so, in the intervals between the attacks, but it rises rapidly during the paroxysms. One case of urticaria gave 6·4, rising during an attack to 11·8, another 5·0 rising to 7·4 and 9·3. Some of our urticarial patients with nocturnal attacks have given figures well within normal limits during the daytime; others, however, have given raised figures even when no eruption was present. A patient with angeioneurotic œdema gave 6·0 in an interval between attacks, rising to 8·2 during one.

The conclusions at which we have arrived from investigations made in a large number of patients are as follows: (1) During the acute paroxysms of allergic manifestations the amino-acid content of the blood is raised. (2) In cases of prurigo of the Besnier type, in which asthma, hay-fever, and ichthyosis were often also present, high figures were usually obtained even during periods of comparative freedom from symptoms. The figure rose still higher during the paroxysms of itching. (3) In cases of simple urticaria or of angeioneurotic œdema, and of asthma without prurigo, the figure may be normal or nearly so in the quiescent stage, but is constantly raised during the attacks.

A raised amino-acid content of the blood has also been found in cases of light sensitisation of the adult type (average figure in 16 cases 7·9), in four cases of dermatitis herpetiformis, in some cases of simple prurigo occurring for the first time in adult life, in prurigo nodularis (three cases), in certain cases of eczema of the "gouty" type associated with a high blood pressure, in a case of dermatitis exfoliativa of unknown cause, in cases of salvarsan poisoning with jaundice, in one patient with cirrhosis of the liver, and in a case of intermittent hydrarthrosis associated with psoriasis. On the other hand, normal figures have been obtained in uncomplicated psoriasis, in two cases of cirrhosis of the liver, in one case of toxic jaundice following tonsillectomy, in a case of sarcoid, and in two of alopecia areata. In healthy, normal subjects the figures are remarkably constant. In experimental anaphylactic shock Hisanobu[29] found a rise in the blood of total non-protein nitrogen and amino-nitrogen.

We have not as yet estimated uric acid and creatinine in the blood in a sufficient number of cases to enable us to draw any definite conclusions, but it appears that during the acute paroxysms their quantity is raised. At all events they are excreted in increased amounts in the urine at and during the period immediately following the paroxysms. Such an increase of non-protein nitrogen excretion has also been observed after attacks of acute urticaria by Longcope and Rackemann.[30]

The significance of a raised amino-acid content of the blood will be discussed later. We know that it occurs in anaphylactic shock, and in the proteose intoxication which Whipple and Van Slyke[31] have shown to take place in experimental intestinal obstruction and in which the non-protein nitrogen in the blood is greatly raised.

Chlorides.

In serum disease, Pirquet and Schick[32] showed that there was a relative increase in weight, which they considered to be due to retention of fluid. Rackemann, Longcope, and Peters[33] demonstrated that there is, during the active stage of serum disease, a marked but transient retention of chlorides and water, associated sometimes with a slight albuminuria and cylindruria, and occasionally with an impairment of the excretion of phenolsulphonephthalein by the kidneys. They stated that in patients with œdema and a gain in weight during serum sickness the plasma chlorides were below normal. Longcope and Rackemann[34] also investigated six cases of urticaria, both during and after attacks. In one patient sensitive to beef and sheep protein the attack of urticaria was associated with a rise in blood-urea, a decrease in the phthalein output, suppression of urine, and almost complete suppression of chloride and nitrogen excretion. Immediately after recovery the nitrogen and chloride excretions were excessive, and the blood-urea, the phthalein output, and the water exchange returned to normal. During this period there was a loss of almost 8 lb. in weight. These results correspond with our own findings in allergic diseases. In infantile eczema, Lust[35] and Lederer[36] found at times a considerable increase in the water content of the blood as compared with that of normal infants, and wide and rapidly occurring fluctuations of the water-content were characteristic. These fluctuations appeared to depend on alterations in the metabolism of mineral salts. Freund[37] found that eczematous infants showed a much greater retention of chloride than non-eczematous infants on the same diet. This retention of chloride was coincident with a rapid gain in weight due to a simultaneous water retention. Meyer[38] found that if eczematous infants were underfed there was a much greater excretion of mineral salts than in normal infants on the same diet.

In considering the chloride content of the blood a distinction must be drawn between the serum content and the whole blood content. The chloride content of a given volume of serum is greater than that of the same volume of whole blood, showing that normally the serum chloride exceeds that in the corpuscles. The normal readings are fairly constant; a series of estimations in normal controls gave figures varying from 570 to 585 mg. per 100 c.cm. of serum, and 454 to 495 mg. per 100 c.cm. of whole blood. These may probably be taken to represent the normal limits. The chloride content is estimated as the chlorine-ion and the result expressed in terms of NaCl, although the actual combination of the chlorine-ion varies in the serum and the red cell; it is probably present as NaCl in the serum, and KCl in the red cell.

In acute and chronic allergic manifestations the whole blood chlorides seem to be markedly diminished during the paroxysms, and the reduction of the corpuscle content is greater than that of the serum content. This reduction was most constantly found in the asthma-prurigo group, and varies with the exacerbation or remission of the symptoms. In simple urticaria the chloride reduction takes place,

like the increase in blood amino-acid, during the attacks and usually returns to normal or may be higher than normal in the intervals. (Table I.)

TABLE I.—*Showing Reduction of Whole Blood Chloride.*

Disease.	Estimated as NaCl.		
	Amino-acid content of the blood.	Serum chloride†	Whole blood chloride†
	Mg. per 100 c.cm.		
Normal	4·0–6·5	570–585	454–495
1. Asthma; icht.; prur. ..	7·0–9·3	577	346
2. " prur.	7·0–9·0	561	363
3. " "	7·0	627	396
4. " icht.; prur. ..	7·0	561	322
5. " prur.	7·0	610	380
6. " "	7·0	—	380
7. " "	8·7	—	305
8. " "	8·7	—	430
9. " icht.; prur. ..	7·0	—	363
10. " icht.; prur.; urtic.	10·0	—	412
11. Prur.	7·2	561	412
12. "	—	577	410
13. Prur.*	8·2	577	462
14. Prur.	7·7	545	425
15. Asthma; icht.; prur.; urtic.	9·3	—	412
16. Asthma*	7·0	577	363
17. Angeioneur. œdema; urtic..	—	—	396
18. Angeioneur. œdema; urtic.*	7·0	—	396
19. Angeioneur. œdema	8·7	—	412
20. Urtic.	7·0	—	429
21. "	8·0	528	428
22. Asthma; urtic*.	7·2	577	430
23. Urtic.	—	577	430
24. "	9·3	—	429
25. "	8·2	—	445
26. "	7·4	—	430
Average	—	—	400·2

Icht. = ichthyosis; prur. = prurigo; urtic. = urticaria; angeioneur. = angeioneurotic.
* Quiescent stage. † as NaCl.

One case of severe prurigo of the Besnier type, associated with occasional attacks of asthma, was investigated at various times. (Table II.)

TABLE II.

Date in 1928.	Condition.	Amino-acid.	Serum NaCl.	Whole blood NaCl.
		Mg. per 100 c.cm.		
April 24th	After being for some time on a vegetarian diet, fairly free from itching.	5·1	577	396
May 1st	After sal volatile, pot., bicarb. and urea. Much better.	—	610	430
May 5th	Relapse with severe itching and asthma following a catarrhal infection with some pyrexia.	7·0	516	363
May 13th	Asthma gone, still itching.	7·7	—	396
June 8th	Worse (menstruating).	9·3	561	428

A case of angeioneurotic œdema gave the figures shown in Table III.

TABLE III.

	Before attack.	During attack.
	Mg. per 100 c.cm.	
Amino-acid	5·8	8·2
NaCl (whole blood)	480	396
NaCl (serum)	580	577

These blood findings correspond to those of Haden and Orr[39] in experimental high intestinal obstruction. They found an increase in the non-protein nitrogen and a diminution of blood chloride. They concluded that the symptoms of toxæmia were due to proteoses, absorbed through the damaged intestinal mucosa, and that chloride was utilised to neutralise these toxic substances. This view is similar to that held by Richet,[40] who showed that experimental anaphylactic shock could be prevented by the previous injection of sodium chloride.

[In a second article the authors deal with the study of the urine in allergic states and with the principles of treatment, with a summary of their conclusions.]

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MEDWAY INFIRMARY.—A new wing of the Medway Workhouse Infirmary at Chatham, entirely for women patients, has been opened by Mr. F. A. Chappell, the chairman of the board of guardians. It will be known as the Medway Hospital, and will not be deemed to be a poor-law institution. The cost has been £37,000, and there is accommodation for 98 patients, of whom the phthisis pavilion will take 12, and the isolation pavilion eight.

KENSINGTON GENERAL HOSPITAL.—The new buildings of the Kensington, Fulham, and Chelsea Hospital are to be begun forthwith. The plans, prepared by Sir Aston Webb and Son, provide for the work to be done in three sections, and the first two are now to be taken in hand. They will provide 65 beds, two operating theatres, and the greater part of the new out-patient department. The old hospital, which was opened in 1887, and has since been twice enlarged, has only 19 beds; the new building, when completed, will contain 107 beds. This is the only hospital in the three boroughs of Kensington, Fulham, and Chelsea, with a population of half a million, for general medical and surgical cases.

THE PHENOMENON OF RETICULATION AND THE ALTERATION IN SIZE OF THE RED BLOOD CORPUSCLES AFTER LIVER THERAPY.*

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Although the staining of red blood corpuscles by vital methods was described by Ehrlich in 1880 [1] and was subsequently investigated by various workers, it is only recently that the technique has been widely adopted as a clinical procedure. The remarkable therapeutic advance in the treatment of pernicious anæmia by means of liver and liver extracts has re-awakened interest in the phenomena revealed by vital staining. Since the response of a case of pernicious anæmia to treatment can be most accurately and rapidly estimated by the degree of reticulation appearing in the circulating blood, it is essential that methods of vital staining should become routine clinical procedures. Various methods have been described. Hawes [2] employed aqueous cresyl blue as the dye of choice, but included in his paper a description of various other staining methods, including those of Chauffard and Feissenger (Pappenheim's stain); Biffi (boracico-blue of Gosio); Widal, Abrami, and Brulé (polychrome blue of Unna); and Biondi (alcoholic cresyl blue). The technique employed by the writers is a modification of that of Hawes [2] and Dameshek,[3] the stain used being brilliant cresyl blue in 0·3 per cent. solution in absolute alcohol. Their procedures have been described in detail elsewhere [4] and will here only be summarised as follows:—

(1) *Fresh Specimens.*—A drop of the dye in solution is spread on a slide and the alcohol allowed to evaporate. Over this a film of blood is drawn in the usual way, and a cover-slip is immediately placed upon it, slight pressure being employed if necessary. Such a preparation remains fluid for some hours.

(2) *Permanent Preparations.*—A small drop of blood is taken upon a cover-slip which has been charged with a thin layer of dried cresyl blue, and a second cover-slip is superimposed. After 30 to 60 seconds the cover-slips are drawn apart and allowed to dry. The films are then counter-stained with Leishman or Jenner (or other suitable fixative and stain), dried, and mounted in balsam.

When a film treated by either of the above methods is examined certain of the red cells are observed to contain within their cytoplasm blue-staining material in the form of granules, rods, filaments, or even definite networks. It is to these cells that the term "reticulated red cells" or "reticulocytes" is applied. A differential count of the red cells may be made and the number exhibiting reticulation expressed as a percentage of the total number of cells counted. The nature of the "reticular" material is still a matter of doubt. Some observers have regarded the phenomenon as being purely necrobiotic; others have held that the material demonstrated by vital staining exists in vivo as a definite constituent part of the cell. If the view is accepted that during the course of development the erythrocyte loses its nucleus by its extrusion entire and not by breaking up intracellularly, it would appear that the reticulum is a pre-existing cytoplasmic structure and not a product of nuclear degeneration. Strong support has been given to this hypothesis by the recently published work of Valentine.[9] If, on the other hand, the reticulum is derived from nuclear material, it should have an affinity for dyes which stain chromatin—e.g., methyl green. The writers were unable to demonstrate this affinity. It is possible, of course, that in process of degeneration the nuclear chromatin has been altered into some new substance.

It is now agreed that the reticulated cells seen in vitally stained films are the same cells as those which show polychromasia in films fixed before staining. A direct numerical relationship between polychromatic and reticulated cells has been repeatedly demonstrated by the writers. It has been suggested that the appearance of reticulation may be an artefact due to coagulation or condensation of the diffuse basophil material in the cell by the action of a powerful basic stain, such as cresyl blue, acting on the cell previous to fixation. Even if this be the case, it in no way detracts from the value of vital staining, since the percentage reticulocyte count is the simplest and most accurate method of estimating the number of young cells entering the circulation. The writers have observed that the first reticulocytes to appear in the circulation have a well-marked reticulum, centrally situated and of so dense a structure that it may be difficult to distinguish the appearance from that of nuclear karyorrhexis. The microscopic evidence thus appears to be in favour of the theory that reticulation

TABLE SHOWING RESULTS OF MEASUREMENTS OF RED BLOOD CORPUSCLES.

Case No.	Date.	Blood count.	Diameter of red blood cells in μ (percentage figures).								No. of cells counted.	Mean diameter.	Index of anisocytosis.*
			4–5	5–6	6–7	7–8	8–9	9–10	10–11	11–12			
1	Feb. 17, 1928.	(a) 5,000,000. (b) 100. (c) 1·0.	0	0	4·2	72·2	23·2	0·3	0	0	475	7·7 ±0·02	5·2 ±0·185
3	Nov. 21, 1927.	(a) 740,000. (b) 20. (c) 1·3.	0	4·1	8·2	14·8	36·3	25·2	8·2	3·0	270	8·58 ±0·05	14·51 ±0·43
4	Nov. 11, 1928.	(a) 850,000. (b) 22. (c) 1·3.	0	2·5	1·5	27	38·5	27·5	3	0	200	8·46 ±0·04	10·99 ±0·38
4B	Jan. 30, 1928.	(a) 4,100,000. (b) 80. (c) 0·98.	0	0·8	2	55·2	40·8	0·4	0	0	250	7·9 ±0·02	6·95 ±0·21
5	Jan. 19, 1928.	(a) 890,000 (b) 26. (c) 1·5.	0	2·4	7·6	15·2	20·4	37·2	10·8	6·4	250	8·9 ±0·06	15·09 ±0·46
5B	March 22, 1928.	(a) 4,080,000. (b) 82. (c) 1·0.	0	1·5	1	39·5	48·5	9·5	0	0	200	8·14 ±0·03	8·23 ±0·28
6	March 25, 1928.	(a) 5,740,000. (b) 95. (c) 0·85.	0	0	4·5	57	36	2·5	0	0	200	7·87 ±0·03	8·64 ±0·29
7	Jan. 20, 1928.	(a) 2,970,000. (b) 26. (c) 0·44.	7	16	71	5	1	0	0	0	200	6·27 ±0·4	10·01 ±0·29
9	Nov. 15, 1927.	(a) 2,470,000. (b) 30. (c) 0·6.	0	0·7	24·6	43·3	20·3	10	1	0	301	7·67 ±0·04	12·02 ±0·34
10	Jan. 25, 1928.	(a) 1,540,000. (b) 22. (c) 0·7.	0·5	1·5	12·5	54	26	4	1·5	0	200	7·72 ±0·04	10·5 ±0·36

(a) Red blood cell; (b) hæmoglobin; (c) colour-index.

* The index of anisocytosis is the ordinary coefficient of variation. In calculating the value Sheppard's adjustments have been used.

* Part of this work has been carried out with the aid of a grant from the Medical Research Council.

is directly connected with nuclear degeneration. On the other hand, reticulation has occasionally been observed in nucleated cells. The whole subject must still be viewed with an open mind.

However doubtful may be the physical basis of "reticulation," there appears to be no doubt that the "reticulocytes" are the cells which have most recently entered the circulating blood from the bone-marrow. It is obvious, therefore, that their presence is in no way characteristic of any individual pathological condition, but is merely evidence of blood regeneration. Thus the writers find that in normal persons they are present to the extent of 0·5 per cent. of the total number of red blood corpuscles. In simple secondary anæmias following hæmorrhage (e.g., menorrhagia, hæmatemesis), the percentage may rise as high as 35, depending on the amount of blood lost and on the functional efficiency of the bone-marrow. In acholuric jaundice, a disease associated with a large and continuous blood destruction, the response of the bone-marrow is evidenced by a percentage of reticulocytes of 15 to 40 over long periods. In all other conditions associated with anæmia—e.g., malaria, cancer, gastric ulcer, &c.—reticulation will be found in proportion to the degree of anæmia and the ability of the bone-marrow to respond.

In pernicious anæmia the subject is of especial practical importance in that a rapid increase in the numbers of reticulocytes in the circulating blood is direct evidence of the efficacy of the therapeutic agent used, and is a valuable guide to prognosis.

The Measurement of the Red Blood Corpuscles in Pernicious Anæmia and other Pathological Conditions.

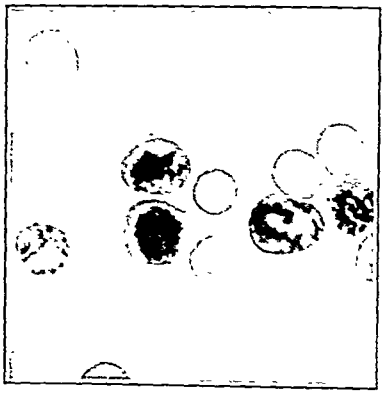
The measurement of the diameters of red blood corpuscles is a matter of considerable difficulty. When the absolute size of the cells is to be considered stained films cannot be employed, since the process of drying produces changes of unknown extent in the diameters. For absolute measurement the cells should be suspended in plasma and a photographic method used, such as that recommended by Ponder and Millar.[5] Even with the greatest care these investigators admit that an error of 0·2μ occurs. In the measurement of dry films by the method of Price-Jones[4] the error is certainly greater, since, in addition to errors due to the optical apparatus, the personal factor in drawing the outline of the cells and estimating the thickness of the pencil mark must be considered. Such investigators as Price-Jones and Ponder, who have studied the technique of the measurement of red blood corpuscles in great detail, fail to agree on what is the actual average diameter of a normal red blood corpuscles. The writers, however, were not concerned primarily with the study of the exact measurement of red blood corpuscles. The objects of the investigation were:—

(*a*) To test the accuracy of the impression that had been formed that the reticulocytes, as seen both in fresh specimens and permanent preparations, were larger than the average adult red cell.

(*b*) To demonstrate the alteration in the size of the red blood corpuscles in pernicious anæmia after treatment with liver or liver extract.

(*c*) To gain some definite idea of the size of the cells in various types of secondary anæmia.

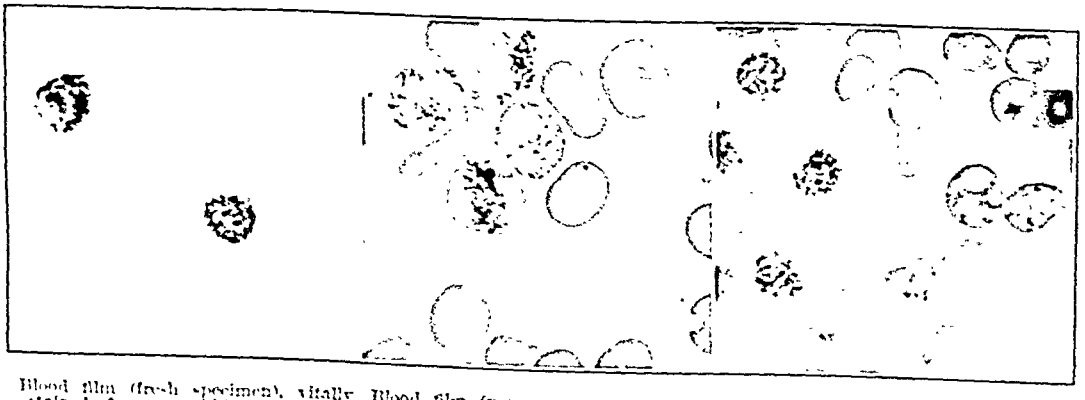
FIG. 1.



Blood film (fresh specimen), vitally stained, from a case of gastric ulcer in which a severe hæmatemesis had occurred 36 hours previously. *Note*: (1) The small size of the mature red blood corpuscles, due to the previous secondary anæmia. (2) The large size of the reticulocytes, whose mean diameter is nearly 9μ. (×1000.)

A projection method was employed similar to that of Price-Jones. Permanent preparations were used of the type above described, the counter-stain being Jenner, followed by dilute Giemsa. Since the method of fixing and staining was in each case the same, the experimental error would appear to be a constant. Films prepared in this way were projected by means of a mirror on to a sheet of white glazed paper. All the cells from several fields were outlined in pencil and subsequently measured. The adjustment of the apparatus was such that the magnification was exactly 1000, millimetre measurements in the projection thus representing measurements of 1μ in the film. Measurements were carried out by means of geometrical dividers, between 200 and 400 cells being measured from each film. In the case of cells which were not circular in shape the "diameter" was taken as the mean of the actual maximum and minimum diameters. Measurements were made at intervals of 1μ, and the cells classified accordingly—e.g., into a group whose diameter was greater than 6μ but less than 7μ; greater than 7μ, but less than 8μ, &c. A cell whose diameter was exactly, say, 7μ was put into the 7–8μ group, and so for

FIG. 2. FIG. 3. FIG. 4.



Blood film (fresh specimen), vitally stained, from a rabbit from which 50 c.cm. of blood had been removed by heart puncture 24 hours previously. *Note*: Reticulocytes are larger than the mature red blood corpuscles. (×1000.)

Blood film (permanent preparation), vitally stained, from Case 5 (see table). In the relapse stage of pernicious anæmia. *Note*: Large reticulated megalocytes whose mean diameter is between 11 μ and 13 μ. (×1000.)

Blood film (permanent preparation), vitally stained, showing reticulocyte "crisis" following treatment with liver extract. *Note*: Various sizes and degrees of reticulation in the cells. (×1000.)

those of exactly 6μ, 8μ, 9μ, &c. In some cases measurements were made at intervals of 0·5μ, but it was found that this involved considerably more labour and did not, for the particular purpose in view, produce any better results. In the later work the films were projected directly on to the ground glass of a microphotographic apparatus and measured there in an exactly similar fashion, the possibility of drawing error being thus eliminated.

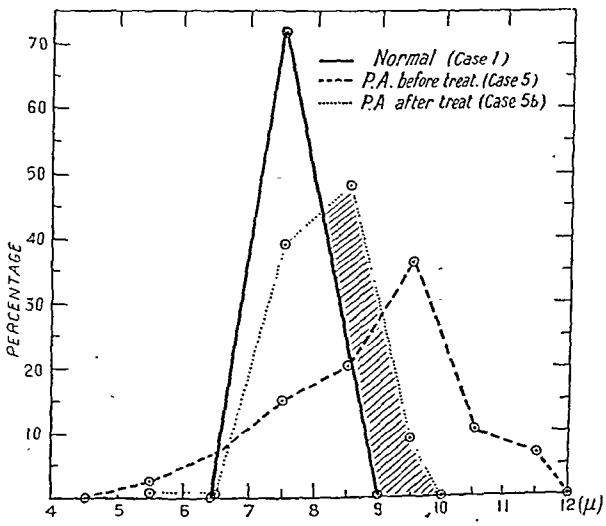
The Measurement of Reticulocytes.

1. *Following Hæmorrhage in Normal Persons and Animals.*—There appears to be no doubt that the first reticulated cells to appear in the circulation are larger than mature red blood corpuscles. A diminution in size rapidly occurs, so that many reticulated cells soon have the same diameter as mature red blood corpuscles. With the maturation of the cell a progressive loss of reticular substance occurs. (See Figs. 1 and 2.)

2. *Pernicious Anæmia in the Relapse Stage.*—An examination of vitally stained films of reticulocytes in the blood in the relapse stage, when the count was a million or less, showed that two kinds of reticulocytes were present: (*a*) Reticulated megalocytes, the largest cells seen, measuring from 9–13μ. (See Fig. 3.) (*b*) Reticulated normocytes from 8–9μ. The dividing line between reticulated normocytes and megalocytes is purely arbitrary. (See Figs. 1 and 2.)

3. *Pernicious Anæmia in the Remission Stage.*—As we have described,[4] the therapeutic administration of liver and liver extract produces in a few days a stimulation of the bone-marrow with a consequent flooding of the circulation with reticulocytes. The majority of these cells are similar to the reticulocyte found in normal persons after hæmorrhage. While larger than mature red blood corpuscles, they are smaller than the reticulated megalocytes already

FIG. 5.



Showing the effect of liver treatment on the diameters of red blood corpuscles in pernicious anæmia (Case 5).

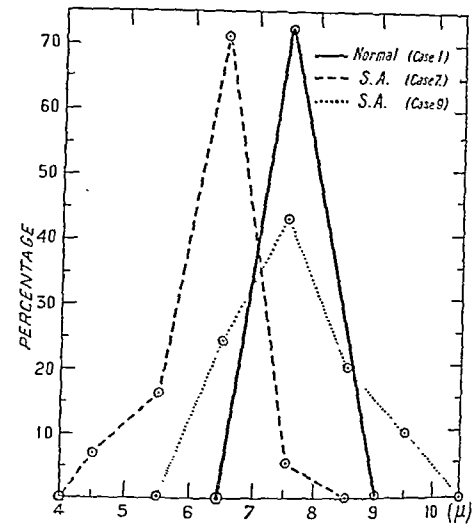
described (Fig. 4). A small percentage of these latter cells are present until the count has reached between 2–3 millions.

The Measurement of Mature Red Blood Corpuscles.

(1) *Normal Persons.*—The table (Case 1) shows that 95 per cent. of the cells have a diameter between 7 and 9μ. The average mean diameter was 7·7μ and the coefficient of variation (index of anisocytosis) was 5·2.

(2) *Cases of Pernicious Anæmia in the Relapse Stage.*—Depending on the degree of anæmia, the diameter of the cells varied from 4·5 to 13μ. Three classes of cells appear to be present: (*a*) very small cells resulting from excessive stimulation of the bone-marrow; (*b*) normal cells from healthy bone-marrow; (*c*) large cells from abnormal portions of the marrow. It is obvious that since the small diameter of the microcytes counterbalances the large diameter of the megalocytes, the mean diameter of the cells in

FIG. 6.



Showing two types of secondary anæmia (Cases 7 and 9), compared with the normal.

pernicious anæmia will be only slightly greater than that of normal persons. In practice this variation is usually 1μ or less. On the other hand, the index of anisocytosis is two or three times as great. (See table, Cases 3, 4, and 5.)

(3) *In Cases of Pernicious Anæmia after Liver Treatment.*—As the number of red blood corpuscles increases a reduction of the number of the small and large cells takes place. When the count has reached 4 millions it is a matter of considerable difficulty to recognise the film as one from a case of pernicious anæmia. Measurement, however, clearly shows that the percentage of cells between 8 and 10μ is higher than that found in normal persons. The mean diameter and coefficient of anisocytosis are markedly reduced, but still greater than normal. (See Cases 4B, 5B.) Fig. 5 depicts the curves of a normal person and of a case of pernicious anæmia before and after treatment with liver. It is typical of several cases with a count of over 4 million red cells which the writers have measured. The shaded area denotes the excess of large cells over normal. The question arises, therefore: Does the blood in pernicious anæmia ever return completely to normal? Minot and Medearis[7] claim that it does, and that the mean diameter may become even less than normal.

Five patients with counts of over 5 million were examined, and it must be admitted that without measurement it would have been impossible to recognise the blood films as those of pernicious anæmia. Measurement, both by the Price-Jones and by the camera method, showed that from 5 to 15 per cent. of cells were still from 0·5 to 1μ bigger than those found in normal persons. (See Case 6.) The coefficient of anisocytosis had not returned to normal, although in one case the average mean diameter was less than that found in the blood of healthy persons.

These findings were fully supported by Price-Jones at the recent meeting of the Pathological Society in Edinburgh. The importance of these observations is that they clearly show that the disease is not permanently cured, but only temporarily improved. Hence cessation of treatment invariably results in a relapse.

The Measurement of Red Blood Corpuscles in Other Anæmias.

Before commencing this work the writers were under the impression that a secondary anæmia with a low colour-index was characterised both by a low hæmoglobin content and a small size of cell. Case 7 illustrates these points. A secondary anæmia, however, of a different type appears to be illustrated by Cases 9 and 10. Although the colour-index is low measurement of the red blood corpuscles reveals the fact that large types of cells are present (Fig. 6).

CASE 9.—Female, aged 50. Diagnosed as pernicious anæmia and treated with arsenic. Remission and great gain in weight. Six months later relapse; no response to arsenic. Blood count: red cells 2,470,000; hæmoglobin, 30 per cent.; colour-index, 0·6. Death.

Post mortem: Gastric cancer and massive involvement of liver; red-currant-jelly appearance of bone-marrow; no metastases in the marrow. As judged by the presence of megalocytes the case could be diagnosed as pernicious anæmia. As judged by the colour-index and the post-mortem findings it was undoubtedly a case of secondary anæmia.

CASE 10.—Female, aged 32. Acute nephritis six years previously. At examination patient was bordering on uræmia. Percentage of non-protein nitrogen, 270 mg. Blood count: red cells, 1,540,000; hæmoglobin, 22; colour-index, 0·7. Treatment with liver extract produced 15 per cent. reticulocytes. Patient died five days later.

Two Types of Secondary Anæmia?

One of us (Davidson, 1928)[8] suggested that the essential feature in pernicious anæmia is a deficiency of some unknown substance necessary for the maturation of megaloblasts in the bone-marrow, while in secondary anæmia the essential feature is either hæmorrhage or the effect of toxins acting on the hæmatopoietic system. If this be so Cases 9 and 10 (see table and Fig. 6) combine the features of both conditions. Hence in Case 10 the response of the bone-marrow to the exhibition of liver extract shortly before death is of great interest. Most workers have found that the beneficial effects of liver therapy in secondary anæmias are inconstantly produced and are never quantitatively so marked as in pernicious anæmia; the writers agree with this in so far as it applies to such cases as 7, which failed to respond. It seems probable that benefit might be expected in cases similar to 9 and 10, since the presence of large red blood corpuscles is suggestive of a deficiency of the specific factor manufactured by the liver cells.

The writers believe that it would be a matter of considerable importance if two types of secondary anæmia could be shown to exist. In both a low colour-index due to deficiency of hæmoglobin is present. One type is characterised by a preponderance of small cells, while the other has a Price-Jones curve similar to that found in pernicious anæmia during the early part of the remission stage. (See charts.)

Liver therapy itself cannot remove the causal condition in secondary anæmia, but, by procuring the maturation of megaloblasts and normoblasts, it would diminish the number of abnormal red blood corpuscles entering the circulation and thus reduce the blood destruction which is proceeding in the reticulo-endothelial system.

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MEDICO-LEGAL ASPECTS OF FRACTURES.*

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THE problems presented by fractures of the long bones are as old as history and as new as the last written chapter of physical science. Six thousand years ago the wealthy athlete of Egypt had his fractured radius splinted by the mid-rib of a palm leaf, and meeting with an untimely death has bequeathed his limb to the Royal College of Surgeons in London. In that same College, the curator, Sir Arthur Keith, is every day investigating the mysteries of bone growth and bone repair under the influence of endocrines, agents of radio-activity, and the subtle interaction of biochemical forces.

But for the moment we are concerned less with the scientific aspects of fracture than the legal responsibility and liability of the fracture-mender. It would be interesting to speculate on the fate meted out to the practitioner of ancient Egypt who made a mess of his job. Possibly the incident ended on the banks of the Nile with a crocodile as a participator, but more probably the legal profession took part in the process of punishment and earned fees in the undoing of the doctor, a proceeding which their descendants have pursued ever since.

The liability of a medical practitioner to a charge of malpraxis is much greater when he is dealing with a simple external injury than when he is treating a patient suffering from an internal or obscure disease. The broken bone is just such a subject about which the general public have that little knowledge which is so dangerous. Not only is the maimed limb visible and palpable to the patient and his friends, but the disability from which he suffers is more or less obvious and permanent: and to these two facts is now added that he is generally in possession of X ray pictures upon which he places his own interpretation.

Injuries and Accusations.

Last year I was enabled by the courtesy of a legal friend to collect brief notes of 50 consecutive cases in which legal proceedings had been threatened or carried out against medical men for alleged negligence or malpraxis in the treatment of fractures. Classifying these according to the bone or region involved we have the following list:—

Clavicle	1	Femur, neck	11
Shoulder	9	,, shaft	3
Elbow	3	Patella	1
Radius and ulna	4	Tibia	3
Wrist	5	Ankle	5
Digits	3		

In a paper in THE LANCET entitled Damages to Bones and Reputations,[1] I discussed these cases in some detail, and I will, therefore, only refer to some general inferences which may be drawn from them. The first and most glaring fact is that most of them turn upon X ray evidence or its absence. One wonders very much whether litigation ever took place about fractures before Rontgen's discovery. In the present series one finds that in no less than 90 per cent. of the cases the radiogram was the dominating factor. In the majority the fact that there had been a fracture at all had been overlooked. Of this the typical and commonest example is the fracture of the neck of the femur, which often occurs with so little violence that neither patient nor doctor can imagine that a big bone has been broken. At first there is very little displacement and practically no deformity. The serenity of the convalescence is

* An address delivered before the Medical Society of London on Nov. 12th.

[1] THE LANCET, 1928, i., 167.

usually disturbed either by the advent of the masseuse who with vigorous exercises quickly demonstrates pain and crepitus, or by the first attempt by the patient to walk, when the weight of the body quickly causes displacement. while the pain and weakness many weeks after the accident point to a grave injury and lead to the belated X ray examination. In another much less common train of circumstances a radiogram is taken at an early date; but it shows so little displacement that the gravity of the condition is minimised, it is thought that the bone is only cracked, or that there is impaction. Later on the masseuse or the body-weight play their part, and full displacement is made manifest.

In another group of cases the nature of the main injury is obvious, so obvious that a radiogram seems superfluous waste of time. But in the course of time, when the chief deformity has been corrected, but pain persists and function refuses to return, then radiological examination is done and some complicating bone injury is discovered. Very often the earlier recognition of this complication would not have had the slightest influence on the early treatment; but the damning fact remains, and is made use of by a querulous patient or by a litigious adviser that the full nature of the injury was not discovered at the time of the accident. Examples of this kind of case are afforded by injuries of the shoulder or wrist. In the former an obvious dislocation may be accompanied by a fracture of the tuberosity of the humerus or of the glenoid fossa. In the latter a Colles's fracture may also have a fracture or dislocation of one of the carpal bones. Or, again, the fracture of the shaft of one of the long bones may be so obvious that immediate setting and splinting are carried out and the patient is restored to comfort. The condition is not examined or disturbed for several weeks and then sooner or later as a matter of routine or because progress is unsatisfactory the inevitable radiogram is taken and malunion is discovered, usually a lateral displacement which looks dreadful to the patient and his friends. Perhaps then operative treatment has to be undertaken and the doctor who first saw the case is expected to pay for this, and he will be lucky if he has not also to pay a substantial solatium to the patient together with fees for litigation.

Yet another type of case is that of a fracture which is treated on ordinary conservative lines, and then for one reason or another falls into the hands of another practitioner. The latter performs an operation and finds some condition which it is suggested shows negligence on the part of the original medical attendant. No radiogram had been taken by the latter, and therefore there is no way of refuting the charge.

For example, a patient with a fractured clavicle, having been treated on the ordinary lines but not X rayed, was transferred to the charge of a second practitioner, who declared immediate operative treatment to be necessary, and further stated that at the operation he had found a splinter of bone threatening the integrity of the vessels and nerves. Needless to say, the splinter of bone was not produced, and the case went against the defendant, chiefly because he had no radiographic evidence to support his contention that the injury was of a simple character which did not require any operative treatment.

I think after this simple recital it ought not to be necessary to say another word in support of the contention that injuries to the bones and joints must be subjected to radiographic examination at the earliest possible moment. Of course there are certain difficulties, such as that of transport or expense, which will have to be met, but in the great majority of cases where trouble has resulted the difficulty of getting the X rays was not the result of circumstances but rather of the deliberately expressed opinion of the medical man concerned, that X rays were not necessary.

A Series of Medico-legal Cases.

At this point I should like to summarise all the medico-legal cases I have examined and to classify them according to the chief factor in bringing the charge, expressing the number of cases in percentages.

Absence of X rays—	
Diagnosis missed	56
Some complication overlooked	18
Malunion not recognised	12
Allegation by hostile practitioner could not be refuted	4
	90
Hostile action based on adverse criticism by another practitioner	10

From this table it will be seen that in addition to the 90 per cent. of cases which turned upon the absence of radiographic evidence there remains about 10 per cent. in which it was the hostile criticism of another practitioner which suggested or supported the idea of an action for negligence. A typical case of this sort is one of delayed union in the leg bones in which after six or eight weeks' treatment by splints or plaster the fracture is found to be ununited and a second opinion is sought. At this stage some fresh treatment is advised, whether by manipulation, an ambulatory splint, or operation.

Unfortunately, the practitioner who carries out this treatment is often not content with having secured the patient, but allows himself to express some hostile criticism, or at any rate assents to an opinion expressed by the patient, hostile to the first doctor. This opinion then actually forms the basis of the action for negligence. This factor of one medical man criticising or condemning another is in reality very much more important than the figure of 10 per cent. would indicate. The great majority of all the other 90 per cent. of the cases, although they may turn upon the neglect of X rays, are nevertheless supported by the criticism of one medical man about the conduct of another. I will return to this point again later at the conclusion of my address.

Tyndall v. *Alcock.*

A case has recently occurred which in many respects marks a new departure in actions against medical men relating to the treatment of fractures, and which I think therefore merits some detailed examination.

Phyllis Tyndall, a girl of 9 years of age, fell on her left elbow at Newent on July 8th, 1926. She was taken by her mother and a friend in a motor-car to Gloucester, a distance of about 10 miles, Dr. Alcock, one of the surgeons to the Gloucester Infirmary, being notified by telephone of the accident.

When the car arrived at his house he saw at once that the injury was of a serious nature. The arm had been held straight out without any splinting or bandage and was by this time considerably swollen round the elbow. He therefore took her straight to the consulting-rooms of an X ray specialist, where the arm was X rayed, showing a supracondylar fracture of the humerus. Under an anæsthetic the arm was manipulated so as to reduce the backward displacement of the lower fragment and the elbow fully flexed in order to retain this reduction. The child was still on the X ray couch and the radiologist examined the arm with the fluorescent screen and told Dr. Alcock that the reduction was satisfactory.

In order to have a record of this condition, a film was taken; but for some reason which I do not understand, instead of taking the picture with the arm lying on the chest, the limb was rotated outwards so that the hand came to lie outside the shoulder. The picture having been taken the hand was brought back so as to lie on the front of the chest on the inner side of the shoulder. It was this radiogram which appeared to be the chief rock upon which Dr. Alcock's case foundered, but I will complete the history of the case before commenting upon it. Dr. Alcock took the child himself in his car to a nursing home and he kept her under his own supervision for some days and for a further period of several weeks at the Gloucester Infirmary, to which institution she was transferred.

The day after the accident it was evident that the circulation of the limb had been seriously interfered with, and within two or three days the position of acute flexion was released and the arm brought down to a right angle. Subsequently it became quite evident that the child had typical ischæmic contracture, together with almost complete fixation at the elbow-joint. The case was tried at the Bristol Assizes in December, 1927, and Dr. Alcock was found guilty of negligence and had to pay £2000 as damages for the injury suffered by the child together with £150 for special expenses incurred by the mother in travelling to and fro.

As I have said, it seems to me that this case marks so grave a departure from all other precedents that we ought to examine it with great care to understand its lessons and, if possible, to suggest some safeguard by which the repetition of such injustice may be prevented. Dr. Alcock was found guilty of negligence, and yet nothing could be more plain than in the ordinary meaning of the term there was never a less negligently treated case than that of Phyllis Tyndall by Dr. Alcock. He met the child at his own doorstep, he took her straight to the X ray specialist, he had her anæsthetised at once, he took a radiogram before the treatment and after, he had another colleague in consultation, he took the child to a nursing home, and he gave her sedulous attention. The treatment he carried out was that laid down as the standard method by current text-books on surgery. I am told that the term negligence is intended to cover a want of ordinary skill, and that this was really what was meant by the verdict against Dr. Alcock. It is quite certain that the jury felt themselves in a difficulty; they came back more than once to consult the judge, and suggested to him that they did not think that Dr. Alcock had been negligent, but he had not set the fracture properly. The judge, however, insisted on a clear-cut verdict either for the plaintiff or defendant, so that the jury found themselves obliged to bring in the verdict they did in order to secure some monetary compensation for the victim of this unfortunate accident. In matters of this sort it is very much easier to attack than to defend, and the attacking counsel lost no opportunity of throwing discredit upon Dr. Alcock's conduct of the case. There was a good deal of conflict of evidence by the various nurses who had seen the child as to the exact way the arm was bandaged and the exact date on which the bandages were released: but considering the case had occurred more than 12 months before the date of the trial such conflicting evidence ought not to have been held to discredit Dr. Alcock's statement.

The most astonishing feature of the trial was the part played by the X ray evidence and the relation alleged to exist between the fracture and the ischæmic contracture. The X ray film taken directly after the manipulation ought never to have been admitted as evidence at all, because it did not represent the position in which the arm was actually fixed against the side. But actually this picture was the most important evidence relied upon by the plaintiff. It was contended that it showed that the fracture had not been properly set, and the jury were easily convinced on this point, because the fractured pieces of bone are evidently not in close apposition. The question as to whether the fracture was set or not had nothing whatever to do with the main point at issue—namely, the occurrence of ischæmia. The actual interference with the circulation was, of course, caused by the arm being too acutely flexed at a time when there was progressive exudation into the tissues of the elbow. At the time when the arm was put up the pulse was not affected, but it disappeared the next day, and then the acute flexion was relieved. If this case had been presented in this light then the charge against Dr. Alcock would amount merely to this: that he put up the arm in the correct way, but either with too much tension at the time or without enough margin of safety to allow for increased tension arising in the tissues. In other words, he was perfectly right to put the arm up in acute flexion according to the standard text-book advice, but that the flexion was too acute. I think it is fairly clear that if the charge had been made in this way the case would have gone very differently. It was merely an error of judgment committed by a careful man who sought every possible assistance and followed out a standard method of treatment.

The plaintiff's counsel chose to go upon something much more definite than this: "a perfectly simple fracture" and X ray evidence that this perfectly simple fracture had not been accurately set. This was the main line of the attack upon Dr. Alcock which resulted in such a surprising verdict.

The Policy of Delay.

Quite apart from one's natural indignation at the injustice done to a careful and conscientious colleague, there arises the serious reflection that a verdict of this kind does so much harm to the conduct of surgical practice. Any man now who is asked to treat a fracture has a right to ask, "Why should I undertake this work which can only earn for me a few guineas and which may make me liable not only to a fine of thousands of pounds against which I can protect myself by the insurance of a defence society, but also to the harassing anxiety of a public trial in which a jury will be asked to decide whether I am a fool or a knave"? It is quite certain that a good many men will have nothing to do with a fracture because of some such line of argument as I have sketched above. But what is still more common and, in fact, is becoming an everyday occurrence, is for medical practitioners to see these cases and to decline to commit themselves to any active treatment; the limb is temporarily immobilised and active treatment is postponed until further opinion can be obtained or until a specialist will take over the responsibility. Such common injuries as Pott's fracture or Colles's fracture or this very thing we have been considering, fracture of the lower end of the humerus, a cautious practitioner will not touch in the first place. He ties up the limb and waits, first for the X rays and then for a consultant, which, of course, means that the period at which easy reduction could have been undertaken has passed by. This policy may be very good for the consultant, but it is certainly very bad for the community; nevertheless, it will, I think, be the inevitable result of such a decision as that made in the Tyndall and Alcock case.

Suggested Safeguards.

In conclusion, I would like to ask the question as to whether any practical suggestions might be made in order to protect the medical man from unjust charges and to secure for the community in cases of accident the willing service of medical men. There are three possibilities of this nature:—

1. That when a doctor is asked to attend an accident case he should ask the patient or the guardians to sign a declaration indemnifying the doctor in case his treatment does not produce a good result. This suggestion is open to many objections. In the first place, the great majority of medical men would never dream of taking this precaution. In the second place, it would be very difficult to draw up an indemnity form which would be held by any law court to be valid.

2. That steps should be taken to prevent any medical man giving evidence against a colleague without some preliminary consultation. It seems to me that this should not only be laid down as an ethical principle, but that it might very well be embodied in the conditions upon which a diploma is given to a newly qualified medical man. In principle the idea I am striving to suggest is quite simple, but it might be difficult to give it legal phraseology. The second stage in every medico-legal action, or sometimes it is the first stage, consists in one medical man accusing another of ignorance, incompetence, or negligence. He may not in the first place formulate the action, but in point of fact he is asked whether he will support it. I am not suggesting that he should refuse outright to express an opinion, but that he should insist on seeing the accused medical man and hearing from him his own account of the circumstances. In serious cases where the action cannot be averted it might be well if a third medical man of eminent position were invited to arbitrate as between the accused and the accuser. I am quite confident that in a large number of cases procedure of this kind would lead to a settling of the disputed case out of court, and it would at any rate prevent the unhappy spectacle of one medical man, who has criticised a colleague, being put into the witness-box and having his opinion distorted and exaggerated by an adroit counsel for the undoing of his brother. The great

advantage of this reform is that it lies wholly in the hands of our own profession, and we should not have to ask the legal profession to give us help and advice in avoiding litigation.

3. That a medical expert be appointed to act as an assessor or assistant to the judge in High Court cases involving charges against medical men based upon technical matters of practice. There is ample precedent for some suggestion of this kind. It is a system which I am told is carried out in France. The county court judges in this country have the assistance of a medical referee in cases coming under the Workmen's Compensation Act, and also, I believe, in the Admiralty Court the judge is assisted by a shipping expert in technical matters. The great difficulty that I see in this suggestion is how to bring it about. Probably it would be stoutly opposed by the legal profession, and it would be difficult to claim any public support for the reform because its mere formulation would be considered to be only in the interests of the medical profession. But I suppose there is very little likelihood of any reform of this kind being introduced at present. Medical opinion would have to be educated and united, whilst legal opposition and obstruction would have to be fought. In the meantime I am sure it is quite wrong for practitioners to be intimidated by one or two exceptional acts of injustice. Fortunately, the great majority of patients recognise and are grateful for the bona fide labour of the doctor on their behalf, and would never dream of vindictive action against him, if his treatment is followed by a bad result. Work carefully done, adequate insurance against risks effected, and a dependence upon his colleagues to act towards him as a brother—these must remain the factors of safety and peace of mind for the medical man who has to undertake the treatment of fractures.

THE SYNERGISTIC ACTION OF ŒSTRIN AND PITUITARY EXTRACT ON THE ISOLATED UTERUS.

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AND

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(From the Pharmacological Laboratory of the Pharmaceutical Society.)

ALTHOUGH it is now five years since Allen and Doisy first described the preparation of an œstrus-producing hormone, our knowledge of the part it plays in human reproduction is still meagre. Thanks to the researches of Parkes[1] we know that the view that the follicles of the ovary are the principal structures which produce it is incorrect, and that there is no justification for the name "follicular hormone." That it plays some part in pregnancy is evident from the presence of large amounts (*a*) in the urine towards the end of pregnancy, and (*b*) in the placenta.

A curious observation, which suggests that œstrin may have a relation to the occurrence of parturition, is that in some animals—the guinea-pig, for example—the phenomena of œstrus, absent during pregnancy, are seen immediately after parturition is complete, and are then again absent until the termination of lactation. The occurrence suggests that at the time of parturition a sudden liberation of œstrin takes place. Having this in mind we began a clinical investigation of the effect of œstrin on the human uterus in labour. This work is not yet complete, but we were able to record some observations compatible with the view that œstrin, in a water-soluble form, when previously injected, enhanced the efficiency of subsequent injections of pituitary extract in maintaining uterine contractions to the end of labour. These observations, though in themselves insufficient to be conclusive, prompted us to see whether, in the laboratory, any synergism between œstrin and pituitary extract could be demonstrated on the isolated uterus.

Some experiments at first sight of this nature have been described by Brouha and Simonnet.[2] They injected guinea-pigs with an extract of follicular fluid in olive oil, and later killed the animals and tested the effect of pituitary extract on the isolated uterus suspended in a bath. They stated that as a result of the injections the uterus muscle contracted more promptly and maintained a prolonged rhythm when pituitary extract was added to the bath. There is, however, much variation in the response to pituitary extract of the uterine horns of different guinea-pigs, and, before they could establish the conclusion stated, it would have been necessary for these authors to have compared a large series of injected and uninjected animals. This they did not do. Moreover, had they done this, there would have been nothing new or surprising in the properly established conclusion. It has always been the bugbear of those whose duties involve the standardisation of pituitary extract on the isolated guinea-pig uterus that the muscle, if removed from the animal during or near œstrus, is so unusually sensitive to the stimulant action of pituitary extract that a proper comparison of two extracts cannot be made. It was to be expected that an artificially induced œstrus would be attended by a similar hypersensitiveness of the isolated muscle.

Material Used.

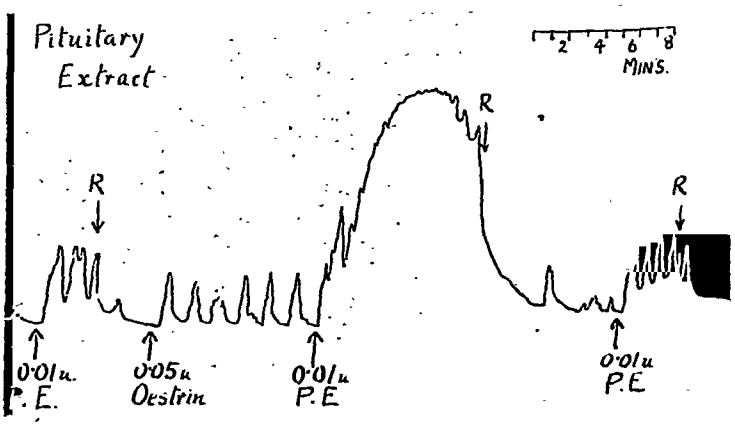
Our own experiments have been carried out with two samples of the water-soluble œstrin which were very kindly presented to us by Prof. E. Laqueur, of Amsterdam. The preparation is sold on the continent under the name of Menformon. They were tested for their ability to produce œstrus in ovariectomised rats in this laboratory, and the dosage given hereafter is the dosage as we determined it. We define the unit as that dose which, given to each rat as a single injection, produces œstrus in 10 out of 20 ovariectomised rats.

Procedure.

The procedure was as follows:—

A virgin female guinea-pig, weighing 180–200 g., was killed by a blow on the head, when its throat was cut and blood allowed to drain out. One horn of the uterus was suspended in a bath of the pattern described by Burn and Dale.[3] The Ringer's solution was of the composition recommended by these workers. The writing lever was

FIG. 1A.



suitably weighted, and when the muscle was properly relaxed, a dose of pituitary extract was determined just large enough to produce a very small contraction of the muscle. In Fig. 1A there is shown (on the left) a small contraction produced by 0·01 units of pituitary extract added to a bath of 100 c.cm. At the mark R on the tracing, the Ringer's solution was changed so as to remove the pituitary extract from the bath. A dose of 0·05 units of œstrin was then added to the bath and allowed to remain during six minutes. At the end of this time the same dose of pituitary extract was again added, but now the contraction was very much greater than that previously recorded. When the muscle began to relax, the Ringer's solution in the bath was again changed to remove both œstrin and pituitary extract. After complete relaxation it was again observed that the pituitary extract alone produced only the very small contraction first recorded.

The isolated uterus of the guinea-pig is well known to display spontaneous changes in the size of the contractile response to a given stimulus; the fact, however, of having the same small response to pituitary extract after, as well as before, the big contraction in the presence of œstrin, is good evidence that a spontaneous change did not take place. This evidence became conclusive when in a series of experiments the same phenomenon was regularly observed.

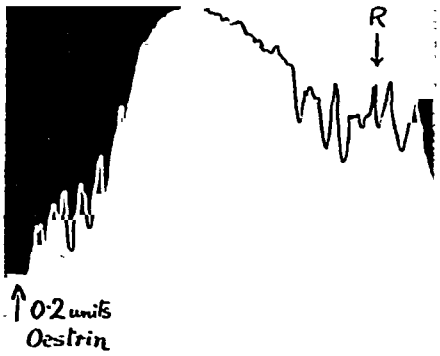
A convincing result is that shown in Fig. 2 in which the muscle was taken from a young guinea-pig of 180 g. weight. The muscle was unusually insensitive, so that a dose of 0·05 units of pituitary extract produced only a trace of contraction. In the presence of 0·5 units of œstrin the effect of the same dose of pituitary extract was very much greater, as shown in the figure.

Specificity of Effect.

It remained to discover how far the increased sensitiveness of the muscle to pituitary extract was due to the specific œstrus-producing principle, and how far it was due to other materials accidentally present in the preparation of œstrin used. It is known, for example, that solutions containing protein have this effect; since, however, the water-soluble preparation of Laqueur contains only traces of protein, it was unlikely that the effect was due to their presence. Unfortunately there is no simple means of destroying the œstrus hormone, so that it was impossible to carry out experiments with an inactivated sample. There remained the possibility, if the effect were specific, that the increased sensitiveness to pituitary extract would be found not to be accompanied by an increased sensitiveness to other uterine stimulants. It is known, from the characteristics of the contractile response, that the mechanism differs in some way according as the contraction is evoked by potassium chloride, histamine, or pituitary extract. Was it the case that whereas œstrin made the uterus more sensitive to the stimulus of pituitary extract, it had little or no effect on the response to the stimulus of histamine? We did not expect that any such difference would be found. If the contractile mechanism were rendered easier to set in motion, we thought that this greater readiness to contract would be displayed to all stimuli. The tracing in Fig. 1B shows that we were wrong, and that œstrin usually has no effect on the response to histamine under conditions in which it augments the response to pituitary extract. In other cases we obtained a slight augmentation of the histamine response.

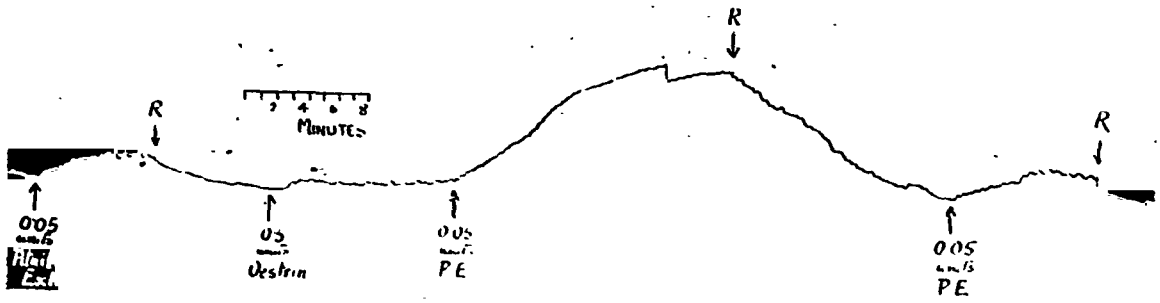
We are of opinion that the absence of any synergism between histamine and the solution of œstrin used is evidence that the active constituent in the solution of œstrin is the œstrin itself. We find it difficult to suppose that a non-specific factor, such as traces of protein material, would augment the stimulant action of pituitary extract, but not that of histamine. Further, the fact that the relationship is specific inclines us to the view that the phenomenon is one

FIG. 3.



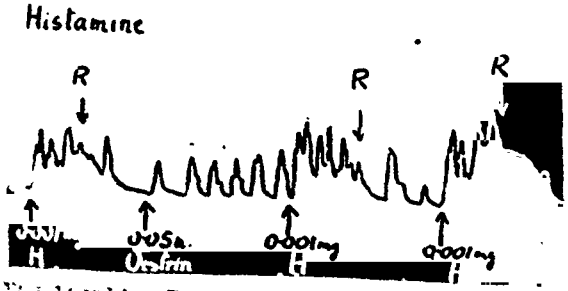
Shows that œstrin itself will cause the contraction of a spontaneously active uterus.

FIG. 2.



A similar picture to that in the upper part of Fig. 1. The uterus in this experiment was very insensitive and the augmentation of the pituitary effect by the œstrin is therefore the more convincingly shown.

FIG. 1B.



[illegible]

of physiological importance, though only clinical investigation can decide whether it can be given a therapeutic application.

It should be pointed out that œstrin itself, in the water-soluble form, will, in sufficient dose, cause a contraction of a spontaneously active uterus (Fig. 3). It is, however, in a quiescent muscle, which is unresponsive even to pituitary extract, that the synergistic action is most convincingly seen.

Mechanism of Parturition.

Dr. A. S. Parkes has pointed out to us that our observation agrees very well with the recent work of Knaus.[4] This worker has studied the sensitiveness of uterine muscle during pregnancy to pituitary extract by a method which obviates the effect due to the presence of the fœtal sacs. He has found that in early pregnancy the sensitiveness is very low, but that towards the end it becomes much greater; he has reason to associate the diminished sensitiveness with the activity of the corpus luteum.

As Parkes[5] has recently pointed out, there is now an alternative hypothesis to that of Dixon and Marshall[6] to account for the onset of parturition. Dixon and Marshall suggested that an ovarian hormone stimulated an output of pituitary secretion from a gland which had been resting during pregnancy. Now we need no longer consider that the pituitary secretion changes in amount from time to time; it is sufficient to suppose that during pregnancy the power of this secretion to stimulate the uterus is depressed by the corpus luteum, while on the decay of the corpus luteum at the end of pregnancy the sensitiveness of the uterus to pituitary extract is enhanced by the overriding influence of œstrin.

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Clinical and Laboratory Notes.

A CASE OF PLURIGLANDULAR SYNDROME: "DIABETES OF BEARDED WOMEN."

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IN 1921 Achard and Thiers[1] described a pluriglandular syndrome in women which, because of its striking clinical picture of virilism, or "hirsutisme," linked to glycosuria, they termed "le diabète des femmes à barbe." They mentioned six characteristic symptoms, the first three being the cardinal signs of "hirsutisme" (Apert),[2] while the last three were inconstant: 1. Hairs on the face (the latter being coarsely plethoric and masculine in type), with partial baldness, especially of the frontal region. 2. Disturbed genital functions. 3. Obesity, usually of the trunk, the limbs often being comparatively thin. 4. High blood pressure. 5. Cutaneous striæ (striæ atrophicæ or striæ cutis distensæ). 6. Glycosuria or lowered carbohydrate tolerance.

Langdon Brown[3] described a case which, he said, apparently belonged, together with one recorded by Parkes Weber, to this particular type of virilism. In Parkes Weber's paper[4] details were given of three similar patients, observed by Anderson, Turney, and Cushing, which although they did not exhibit glycosuria, in other respects closely resembled the case of Langdon Brown and Parkes Weber. As so few descriptions are found in the literature, the following case seems worth recording:—

An unmarried woman, housekeeper, aged 45, was admitted to the Medical Unit of St. Mary's Hospital on Nov. 1st, 1927. She complained of (*a*) excessive thirst; (*b*) increasing disinclination for food other than fruit; (*c*) weakness and numbness of the legs; (*d*) blurring of the vision; and (*e*) "a sinking sensation in the pit of the stomach with a feeling of blood rushing round the neck and chest." Apart from a tendency to stoutness since puberty she had always been alert, energetic, and in excellent health, until 1927 when she began to suffer from menorrhagia. While convalescent from an operation for hysterectomy in September, 1927, she was confined to bed for six weeks with thrombosis of the left long saphenous vein. Both she and her relatives dated the onset of her present complaint from the time of the operation.

The face was florid and pigmented with purpuric spots on the nose and cheeks. The breasts and chest were deeply pigmented. Obesity was marked, particularly of the back of the neck, arms, breasts, abdomen, and thighs; body-weight, 12 st. 8 lb. The legs were œdematous, the skin rough, scaly, and dry, with hyperkeratosis of the soles of the feet. The eyes were slightly prominent and the vision blurred, but the fundi were normal and there was no hemianopia. The mentality was dull and somewhat childish, the reflexes sluggish, and a fine tremor was apparent on extending the fingers. No enlargement of the heart, spleen, or liver could be detected.

The urine showed albumin, pus, traces of blood, sugar (7·2 per cent.), and diacetic acid (trace). The reaction to insulin was irregular; at one time she had 1·8 per cent. sugar in the urine on diet and 70 units of insulin, while later she was sugar-free on a diet of 1595 calories without insulin. A blood-sugar curve showed a resting value of 370 mg., rising to 413 mg. one hour after 50 g. of glucose were given, and falling to 360 mg. per 100 c.cm. in two hours. Blood pressure: systolic, 240; diastolic, 160. On admission the red cell count was 5,720,000 and the white cell count 15,800, but in one month these fell within normal limits. The blood volume, determined by the "vital red" method, was found to be less than normal—one-fourteenth (7·3 per cent.) of the body-weight, or 69 c.cm. of blood per kilo of body-weight with a hæmatocrit value of 54 per cent. The blood-urea was 31 mg. per 100 c.cm. The quantity of blood cholesterol was too minute to estimate. Microscopic examination showed the capillaries around the nail beds to be less numerous than normal and of distorted and abnormal outline. No enlargement of the pituitary fossa was apparent in X ray films. No evidence of sepsis was found in tonsils, sinuses, or antra. The basal metabolic rate was plus 20.

The patient developed an acute parotitis and one septic tooth was removed. The traces of blood and albumin persisted in the urine. Increasing drowsiness and mental torpor were accompanied by asthenia and painful cramps of the legs and back. She became almost bald on the frontal region, and while hair was shed from the head, hirsuties appeared on the chin and upper lip. The face and breasts (*areolæ*) became more deeply pigmented and the purpuric spots more numerous and widely distributed. She bruised very easily, but at no time did she exhibit definite cutaneous striæ. She was diagnosed as a case of pluriglandular defect, but the administration of various combinations of glandular and polyglandular preparations produced no improvement. During the last two months her pulse-rate was rapid (96–112), and her temperature, which had been normal for a month, began to rise in the later stages, when an icteric tinge was noticeable. After being in hospital for five months she died from heart failure and nephritis on March 2nd, 1928.

Post-mortem Examination.

Autopsy performed by Dr. W. D. Newcomb 54 hours after death revealed the following conditions. Heart: fatty degeneration and great hypertrophy (weight 550 g.). Lungs: one typical oat-celled carcinoma 1 cm. in diameter. Liver: central congestion and necrosis of lobules with peripheral fatty change. Kidneys: purulent infiltration of both cortices and medullæ. Spleen: slightly enlarged and congested; Malpighian bodies small. Bone-marrow: right femur showed hyperplasia, upper 35 cm. red, lower 5 cm. fatty. Microscopic examination showed that half of the red marrow was fatty and that erythro- and leucoblastic elements were present in about equal numbers, while megakaryocytes were unusually small and numerous.

Choroid plexus: bilateral psammomata. Pineal body: normal. Pituitary gland: enlarged, and much colloid was found in large vesicles in the intermediate lobe. Thyroid: colloidal adenomatous hyperplasia. Thymus: replaced by fat.

Pancreas: islets of Langerhans apparently normal (there was much fatty infiltration and post-mortem degeneration throughout the gland).

Suprarenals: enlarged. The cortices contained very little lipoid and there was a large amount of iron-free brown pigment in the zona reticulata. The medullæ were larger than normal and showed patchy perivascular lymphocytic infiltration.

Ovaries: enlarged and fibrosed, containing a few ill-developed Graafian follicles. The capsules were thick and fibrous and exhibited numerous corpora albicantia.

It appears from this and previously reported cases of "diabetes of bearded women," that in addition to the six characteristic signs of the condition (vide supra), the following three points may be of considerable diagnostic importance: 1. A minor degree of double exophthalmos. 2. An increased basal metabolic rate. 3. In the early stages a definite, although mild and transient, polycythæmia.

Exophthalmos of slight degree with optic neuritis was reported in the cases of Cushing, Anderson, and Parkes Weber. Turney's case showed retinal changes, three-fourths of the right disc being surrounded by a white subretinal exudation, and Parkes Weber remarked upon the presence of white foci around the discs of his case. In the case here described no retinal changes were associated with the exophthalmos.

Polycythæmia was reported by Turney, and Parkes Weber's case apparently had an abnormally high erythrocyte count in the earlier stages.[3] In the light of these facts it is possible that the figure of 5,300,000 red cells per c.mm., recorded in the cases of Cushing and Langdon Brown, may have indicated an earlier polycythæmia.

The basal metabolic rate has been recorded in only two of the above-mentioned cases. Parkes Weber's case had a B.M.R. of plus 20, and Langdon Brown recorded a B.M.R. of plus 15. He remarks that this result is interesting in conjunction with the marked obesity.

I have not found any record of the microscopy of the capillaries in other reported cases, but the findings in the present case suggest that the remarkably poor definition and distortion of the outlines of these vessels may well be the explanation of the bruising and petechial hæmorrhages which have been features of almost all the cases recorded.

I have to thank Prof. F. Langmead for his kindness in permitting me to report the case when I was house physician to the Medical Unit.

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NOTE ON A URETHRAL CALCULUS OF UNUSUAL SIZE.

By H. R. B. Hull, M.R.C.S. Eng.,
AND
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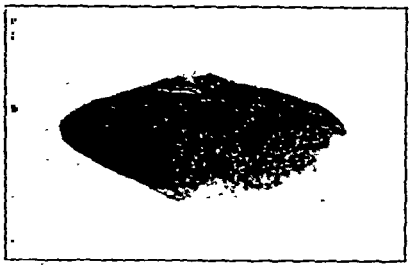
Urethral calculi are usually secondary, that is to say, they do not originate in the urethra, but from small calculi passed into the urethra from the ureter, bladder, or prostate. Primary stones are rare, seldom attain a large size, and are with few exceptions single. Whatever their origin, their retention in the urethra without symptoms is most exceptional. The stone in this case was very large, and there were certain features which seem to us worthy of record.

The patient, a stoker, who was in training for the Fleet Marathon Race and had run six miles a few days before, sought advice on account of a thin mucoid gleet. There was a history of gonorrhœa seven months previously, complicated by epididymo-vasitis. Whilst palpating Cowper's glands, a hard spindle-shaped body was found lying in the long axis of the bulbous urethra, apparently within its lumen. The patient was unaware of its presence. His health during the past four months had been excellent, and there was no history of impaction.

Attempts at urethroscopy were unsuccessful, owing to the small calibre of the fossa navicularis. Operation was performed on board the hospital ship *Maine*. A sound was passed after meatotomy. This showed that the foreign body was a stone in the bulb and removal through a perineal incision was easily effected. The floor of the bulb was of normal thickness. The divided layers were sutured over a catheter, which was removed on the fourth day. Slight leakage of urine occurred for a week. The wound was soundly healed on the nineteenth day after operation.

The stone weighed 163 grains; its length was 1¾ in. and its greatest diameters were ¾ in. and ⅝ in. On section it had a hard outer shell, covering a laminated phosphatic core. Owing to an error in gauging the focal distance of the camera, the photograph here reproduced is a little smaller than the actual size. The raised facet shown in the photograph was lying ventrally over the openings of Cowper's glands.



Calculus removed from the bulb of the urethra (slightly less than actual size).

That there was considerable distension of the bulb was shown by the fact that, during convalescence, the patient had to press the perineum over the bulb after micturition in order to avoid dribbling of urine. When the tissues contract, as they will in the course of time, urination should become normal.

To adjudicate whether the stone was primary or secondary is a matter of some difficulty. The history suggests that it was primary.

A NOTE ON THE PAIN SENSE OF THE PARIETAL PLEURA.

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In a recent communication to The Lancet[1] on the Mechanism and Elements of Pleural Pain, I stated that it is generally accepted that the visceral pleura is insensitive, that the costal parietal pleura is supplied with sensory nerves from the intercostals, and that certain types of irritation or stimulus to the membrane are experienced by the patient as definitely localised pain. I find, however, that some authorities, influenced largely by the observations of Sir James Mackenzie, still state that the parietal pleura has no pain sense. Samson Wright,[2] for instance, says:—

"Irritation of the pleura reflexly produces coughing, but no pain sensibility is present in the pleura. This statement seems greatly at variance with the well-known severe pain of pleural inflammation. Neither scraping nor penetration of the parietal pleura produces pain, as can be well shown when resections of the ribs are carried out under local anæsthesia. The nerve-supply to the pleura is not known; cerebro-spinal nerve-fibres do not appear to have been traced into, nor do nerve plexuses lie in the surrounding connective tissue."

On the other hand, such writers as Behan[3] and Schmidt[4] are of the opinion that the parietal pleura is definitely sensitive. Behan states that the parietal pleura is innervated by the intercostal, sympathetic, and vagus nerves, and the visceral by the vagus and sympathetic.

Up to the present little anatomical evidence has been adduced to support the theory that the parietal pleura is supplied from the intercostal nerves. Prof. F. G. Parsons,[5] however, in a recent dissection of a part of the chest wall, showed quite clearly branches from the intercostals going to the parietal pleura. A. S. Dogiel[6] demonstrated the presence of sensory end-bulbs in the human parietal pleura, and M. J. King,[8] quoted by H. A. Bray,[7] found them in the parietal pleura of the rat, calf, rabbit, and guinea-pig. Bray also quotes the observations of S. V. Sewell[9] who noted that in operations under local anæsthesia manipulation of the non-anæsthetised parietal pleura evoked exquisite pain. The important experimental and clinical work of J. A. Capps[10] on pleural pain showed very clearly that mechanical irritation of the inner surface of the costal parietal pleura nearly

always produced sharp and accurately localised pain, and that the pain sense was more marked anteriorly and laterally than in the posterior part of the membrane.

My own observations during the past five years have led me to the conclusion that the parietal pleura is richly endowed with pain sense. On the many occasions when I have been carrying out exploratory puncture of the chest, artificial pneumothorax, or aspiration of pleural fluid, I have paid particular attention to this point, and I have found that in nearly every case the parietal pleura is extremely sensitive, and gives rise to definitely localised pain when a needle passes through it. The needle in passing through the chest wall evokes pain in only three structures—the skin, the rib periosteum (if it should be touched), and the parietal pleura. The intercostal muscles and other structures are apparently insensitive, at least, to the stimulus set up by the needle. The patient describes the skin pain as an "ordinary" sharp pain, whereas the pleural pain is likened to a severe toothache or "neuralgia." In any case the patient, if questioned, has no doubt that there is a remarkable difference between the two pains. The intensity of the pain varies, of course, with the patient's temperament, the state of the general health, with the sharpness and size of the needle, and with the condition of the pleura—i.e., the pain is more intense in the presence of acute or subacute pleurisy than if the pleura is normal. If the pleura is not anæsthetised pain in some degree will be evoked by the passage of a needle in almost every case. When a thin and very sharp needle is used little pain is experienced, but a large and comparatively blunt needle evokes a considerable degree of pain. When a blunt needle is used a good deal of pressure has to be exerted to force the needle through the pleura, so that tension is set up at right angles to the plane of the membrane. A very sharp needle passes through with a minimum amount of resistance and produces little or no tension in the membrane. These facts suggest very strongly that the chief stimulus necessary to evoke pleural pain is tension or stretching.

It might be argued, and with some justification, that the pain arises when the needle is passing through the layer of connective tissue overlying the parietal pleura. That this is not so can be proved, to my satisfaction at least, by putting a needle attached to a syringe containing fluid through the chest wall when a pneumothorax is present. When the point of the needle is in the pneumothorax cavity bubbles of air can be withdrawn through the fluid in the syringe. These air bubbles cannot be withdrawn when the point of the needle is still in the structures of the chest wall. Thus by exerting traction on the piston of the syringe while the needle is traversing the chest wall air bubbles will come back into the syringe as soon as the needle point enters the pneumothorax cavity, and hence the exact position of the inner surface of the parietal pleura can be accurately determined. Again, by cultivating the sense of touch, one can tell by the feeling of resistance to the needle point that the outer surface of the parietal pleura has been reached. On pushing the needle through the membrane one can feel a definite diminution of resistance and even a slight elastic recoil. By these two methods, the one visual and the other tactile, the position of the pleura can be established. In practically every case the patient will be found to experience a definitely localised "neuralgic" pain while the needle is passing from the outer to the inner surface of the parietal pleura.

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Medical Societies.

HARVEIAN SOCIETY OF LONDON.

A MEETING of this Society was held on Nov. 8th. The chair was taken by Dr. HERBERT FRENCH, and Dr. H. P. BAYON read a paper entitled

A COMPARISON OF SOME ASPECTS OF CANCER IN MAN AND LABORATORY ANIMALS.

He said that there were certain differences between animal and human cancer that should be taken into account before experimental results could be clinically applied. Neoplasms in laboratory animals could be grouped into three ætiological classes, of which the first only had no counterpart in clinical medicine. These classes were: (1) strain-tumours, inoculated, grafted or otherwise transferred from one animal to another; (2) tumours experimentally induced by tar, parasites, or other irritants; (3) spontaneous tumours. The first class differed from others in that they frequently retrogressed after incomplete operative removal. The second class were not necessarily as virulent or as easily grafted, but they infiltrated more actively and therefore could not be so easily cured by operation. Laboratory tumours were influenced in their inception and development by racial and individual properties which seemed to be localised in the surrounding tissue cells. Malignancy was the result of interaction between properties present in the multiplying and invading type of cell, and the reactions in the surrounding tissues, which remained passive or hypertrophied to a greater or lesser extent. There was morphological similarity between tumours of different animals, but microscopically identical neoplasms might differ considerably in transmissibility and rapidity of growth. The appearance of a cell in section only indicated its behaviour at a certain moment. As was well known, a tumour might be clinically malignant and pathologically innocent. Two distinct properties made up strain virulence: the rate of growth and the capacity for invasion. For example, the Jensen rat sarcoma grew rapidly, did not invade and often receded, while mouse tar-cancer grew slowly, invaded early and did not recede when once it was established. The host's resistance was difficult to measure, as repeated inoculations overcame it. All these properties seemed to be subject to recurring rhythmical variations.

Classification of Malignancy.

A grouping of degrees of malignancy was possible. (1) The worst degree, of which the small round-celled sarcoma was the type, was inoperable and rarely regressed. (2) The second grade demanded complete and early surgical removal, as it rarely regressed. (3) The third class was a slow growing tumour—e.g., endothelioma, perithelioma, and fibrous and endothelial neoplasms. These often regressed and partial removal was often followed by absorption of the remnant. Even a late case should be treated surgically. Animal experiment showed how much the result of operation depended on the skill of the operator. The rapid growth of a number of large cells put a strain on the organism, perhaps comparable with that of pregnancy, and even if the growth were completely removed the animal might not recover. Microscopy, although at times it might mislead, remained the best single method of diagnosis.

Prof. E. H. KETTLE pointed out what enormous strides cancer research had made in improving knowledge of the cancer process, even although it had not gone far towards finding cause or cure. The usefulness of the "strain cancer" had practically been exhausted, except as a field for the study of certain therapeutic agents. It was completely artificial and more nearly resembled a tissue culture than a primary natural cancer. Induced cancers, on the other hand, were in every way like spontaneous

human cancer. The laboratory worker could produce cancer in a high proportion of animals in a reasonable time with perfect regularity; he could modify the production, analyse the factors which led to it, and reproduce phenomena which actually occurred in human cancer. The total cancer incidence was about the same for every species of animal and for every race of man, but the organ incidence differed. Cancer of the breast and uterus reached high figures in this country, but was low in Holland, where the total was made up to a greater extent by cancer of the alimentary canal. The explanation of this curious difference probably lay in the factor of immunity. Apparently growth of one cancer inhibited the development of cancer elsewhere. The recognition that neoplasms occurred in all species of animals must make it clear that cancer was not to be ascribed to influences of diet or civilisation.

Mr. D. C. L. FITZWILLIAMS said he found it very hard to regard the single adenomatous cancer and the multiple epitheliomatous cancer as more nearly related than first cousins, and some animal cancers as more than second cousins to human growths. The Rous tumour was nearer a granuloma. It was a curious thing that if a tar cancer could be produced in a mouse in a given number of days, a second cancer could be produced by painting a different area simultaneously in half that number of days—i.e., with only half the irritation required to produce the original growth. The inhibition which prevented all other precancerous cells from invading the basement membrane of a breast-duct when once one of their number had become definitely cancerous was a most strange thing. He had ceased to believe in the radical operation for mammary carcinoma; if the one small cancerous area could be reached and removed the patient was cured; if the lymph glands were invaded, the lymph was flowing in another direction and the cancer had already been conveyed to the internal organs, whence it could not be removed. The number of cancers that would shrivel up if three-quarters of their substance were removed was striking. Spontaneous cures did occur. Sometimes the patient's resistance would hold the cell in check for many years and then break down; the cancer cell must have been living all that time, for it would then grow with extraordinary rapidity. The gravest form of breast tumour was carcinomatous mastitis, usually sent in to hospital as a breast abscess; for these cases nothing could be done.

Neoplasms in Animals.

Prof. FREDERICK HOBDAY said that malignant tumours were very common in animals. Insufficient stress had been laid on the ubiquity of cancer, and collaboration between veterinarian and physician was of the utmost importance. Many questions called for answer. Why was cancer so uncommon in the animal uterus? Why was a malignant tumour of the normal testicle of the horse most rare while in the cryptorchid testicle it was very common? Why did veterinary surgeons constantly meet cancer in the penis, the vulva, the frontal sinus, the orbit, and the membrane of the eye? The smallest growth on the membrane of the eye in a cow or a horse was a most alarming thing to the veterinary surgeon. In the dog the commonest site was the tonsil, followed by mamma and testicle. Rodent ulcer was not uncommon in the cat. Infective growths of the penis and vulva of the dog had been a very grave trouble, especially among bulldogs, but had been practically stamped out by insisting on veterinary examination of every dog and bitch before service and by surgical treatment.

Prof. TOM HARE observed that the problem of cancer had passed far beyond the sphere of the clinician; the more one saw of the disease in animals, the more one felt that only the research worker could throw light on the problem. It was often extremely difficult to distinguish between a neoplasm and a granuloma, and glaring mistakes had been made through the failure of animal experimenters to benefit from the experience of veterinarians.

Prof. C. A. PANNETT did not think it possible to distinguish three grades of malignancy. The essential thing was that certain cells were beginning to divide and to separate; the cement was gone. It was impossible to tell whether or not some of these cells had disseminated cancer through the body. There must be some underlying factor common to all the forms of irritation that produced cancer; what could be more irritating than shaving? Yet it never caused malignant growths.

What, interpolated Prof. HOBDAY, could be more gravely irritated than the udder of a cow? Yet cancer of that part was extremely rare.

Dr. F. COKE asked why arsenical cancer sometimes had such a long incubation period, and whether there was any incubation period between the removal of a growth and the time when immunity to further growths began.

Mr. FITZWILLIAMS referred to statistics which showed that American immigrants kept their racial cancer incidence for a certain period and then merged into the general American incidence-ratio. The professional incidence was also most curious.

Dr. BAYON, in reply, urged clinicians never to lose courage with any tumour; not everything that was cancer was malignant and not everything malignant was cancer. There was no 100 per cent. diagnosis or treatment, and coöperation between clinician and pathologist gave the best results. He regarded cancer as an absolutely localised condition, unlikely ever to be diagnosed by a general reaction.

MEDICAL SOCIETY OF LONDON.

AT a meeting of this Society held on Nov. 12th under the presidency of Dr. WALTER CARR, a discussion on the

MEDICO-LEGAL ASPECT OF FRACTURES

was opened by Prof. E. W. HEY GROVES, who delivered the address printed on p. 1017. He was followed by Dr. JAMES NEAL, who said that the position with regard to the treatment of fractures was from the legal point of view essentially the same as for all other forms of treatment and was governed by the implied contract to exercise reasonable skill and care. The jury had to decide whether or not reasonable skill and care had been exercised in any particular case, but had not to fix the standard. That had been fixed by the law as the amount of such skill and care as would have been exercised by the ordinary reasonable practitioner in the same branch of the profession. The term "reasonable" could only be applied relatively. A rural practitioner could not be expected to possess the resources of a hospital surgeon. The usual basis of a claim was failure to diagnose, although the treatment of a recognised fracture might be questioned. Resulting deformity, loss of function, or non-union might be the cause of action and the claim might then be difficult to rebut. Patients to-day expected far more perfect results than formerly, and the doctor might have to manipulate, fix, and radiograph several times until a perfect position was obtained. Each and every detail of the treatment might be challenged, even instructions to nurse, masseuse, or patient. Failure to exercise reasonable skill and care alone rendered a doctor liable to damages, and it was of the utmost importance to adopt routine precautions and to avoid any appearance of carelessness. Detailed and frequent examinations were of the greatest value in court. Very few claims made against doctors actually went to trial, and in most of these there had been some very definite omission, usually of a radiogram. X rays should be employed: (1) whenever the diagnosis was in doubt; (2) after fixation of the fragments; (3) a week later, to be sure the position was satisfactory; and (4) later still, to confirm the maintenance of the position. It was wise to have a second opinion on any difficult or unusual case. If reasonable care and skill were exercised from start to finish doctors need no more fear litigation after a fracture case than after any other. The real difficulty

was that the question of negligence was decided by a jury, and that once the jury had found negligence, on the flimsiest of evidence, there was little hope of a successful appeal. Dr. Neal could not subscribe to Prof. Hey Groves's three suggestions for minimising the peril of the doctor. The Medical Defence Union had always been advised that no form of indemnity would protect a doctor from an action for alleged negligence, and it might make him even less careful than he would otherwise have been. The suggestion of requiring doctors not to give evidence against their colleagues was utterly impracticable and would not solve the difficulty. Anything likely to lead the public to believe that the first consideration of the doctor was his own interests would make him suspect in everything he did. An expert assessor would be highly dangerous, for he might hold the most peculiar views on the matter in dispute, and if the judge was to be influenced by him the benefits of skilled cross-examination of medical experts would be nullified.

Mr. ZACHARY COPE said that even X rays often gave contradictory evidence in neglected fractures of the hip. Further, changes might take place in a few weeks which made the line of fracture difficult to see. X rays were very troublesome to interpret, and grave charges might be made on evidence which was capable of contradictory interpretations.

Surgeon-Commander A. GASKELL said that the Navy had very many fractures though not many legal actions. His conclusion was that the most dangerous person was the optimist who told the patient all was well, especially in fractures about the elbow-joint. The proper attitude of the medical man was to be pessimistic, and to prepare the relatives for the bad result which would occasionally follow even the best treatment. A second opinion was one of the chief safeguards against legal action. Some results looked deplorable in radiograms but were functionally excellent.

Mr. R. C. ELMSLIE said that in the Wood Hill case he had given an exact duplicate proof of his evidence to both sides and left it to the solicitors to decide which should call him. The evidence in that case on the instructions given to the patient had differed so widely that it was very difficult for a jury to assess what had actually happened. Moreover, the doctor had kept no record of the site of fracture. The moral was to keep most careful records of what was ordered and of what was found on examination. In another case a copy of a letter written three months before had been instrumental in preventing action against a practitioner.

Mr. DONALD ARMOUR said that doctors were apt to become advocates as well as witnesses; he did not agree that it was necessary to give evidence on one side or the other. In a similar case he had refused to furnish proof of his evidence and had declared in the witness-box that he appeared on subpœna and not for either side. The judge had upheld this attitude throughout.

Dr. E. M. CALLENDER quoted a case where a radiogram taken by a local chemist with ancient apparatus had caused a wrong diagnosis. The possession of very old apparatus might be a positive danger.

Mr. H. A. T. FAIRBANK also spoke of the danger of trying to form an opinion on imperfect radiograms. Trying to save the patient's pocket in this way let down both patient and practitioner. The surgeon, in doing his best for his patient, sometimes had to "give away" the doctor by recommending operation, but he must absolutely refuse to criticise former treatment, however hard it might be to refrain. He should say that, not having seen the case at that time, he could not assess the difficulties. If they said: do you think operation would have been advisable earlier? the surgeon must hedge. Before giving any opinion of the rights or wrongs of the case the surgeon ought always to see the former practitioner privately. It was unwise to tell the patient that he would not say anything before he had seen the doctor, because that involved him in giving an opinion afterwards, which was often better avoided. The idea of a medical assessor was excellent; he would be able to help the judge in estimating small amounts of displacement and the like.

Mr. WARREN LOW said that X rays were an excellent servant but a hard master; doctors should never become slaves to the "X ray habit." X rays were much more useful after the fracture had been dealt with than before, and treatment should never be delayed for the radiologist. Every treatment was a process of trial and error, and patients could often be made to understand that the failure of the first treatment did not mean inefficiency or negligence. The indemnity method of protection was quite out of the question. The county court judge was not obliged to ask or to follow the opinion of the assessor at present, and the high court judge often would not do so if medical assessors were appointed. Nevertheless, only along those lines would doctors get any assistance from the bench.

Mr. ARMOUR related an experience with a medical assessor in the county court. The case was one of fractured femur and the assessor a very distinguished consulting physician.

Dr. REDMOND ROCHE related cases in which the taking of a radiogram had been disastrous. Two were obvious Colles's fractures not shown in radiograms taken by highly skilled radiologists. X rays were not absolutely essential to diagnosis and treatment. Clinical evidence, judiciously exercised, should be the deciding factor as to whether or not a radiogram should be taken. The profession ought not to allow the radiologist to persuade the bench and the public that a doctor who had not taken a radiogram had not fully performed his duty.

Mr. W. E. TANNER said that "simple fracture" was a most unfortunate term, and proposed instead the use of "open" and "closed."

Dr. ANTHONY FEILING said that the suggestion of discussion between "accuser and accused" was Utopian; after such a consultation in private the evidence of both would be looked on as suspect in court. He capped Mr. Armour's story with another county court case in which four neurologists gave evidence that the onset of paralysis agitans had no connexion with a previous slight scalp injury. The judge ruled otherwise, his assessor agreeing with him. The assessor was a surgeon.

Mr. H. W. CARSON quoted Lockwood's aphorism that what came out of a broken bone was not red marrow but black ingratitude. The public was wrongly educated, and thought that all fractures could be treated with a perfect functional result, which was in fact unattainable in the hands of the best orthopædic surgeons. They were also misled in their opinion of the value, importance, and inevitability of an X ray photograph. Radiograms were very difficult to take and still more difficult to read. The public should learn that a single photograph in an unknown plane was most misleading and that reliance must not be placed upon it.

The PRESIDENT spoke of the dilemma of the physician between the command that every fracture be radiographed and the grave warning that the results of radiography might cause serious trouble.

Prof. HEY GROVES, in reply, explained that by "accuser" he meant a medical man who had impugned the results of a colleague in a way that he could not have done had he been aware of the facts of the case. The adoption of a second line of treatment did not necessarily condemn the first. Mr. Low had rightly said that X rays should be our servant and not our master, but we could not afford to neglect their service. They should be regarded as secondary to clinical examination.

Dr. NEAL, in reply, emphasised that he only regarded a radiogram as essential in cases of doubtful diagnosis. The last thing he wished to suggest was that a medical man should rely mainly on it for diagnosis. Its great value in court was that it was something objective, which the jury thought they could understand, and it went a great way towards deciding the case.

ROYAL SOCIETY OF MEDICINE.

SECTION OF PSYCHIATRY.

THE Presidential Address to this Section was delivered by Sir MAURICE CRAIG on Nov. 13th and was entitled

A Survey of Some Conditions Conducive to Mental Disturbance with Suggestions as to their Treatment.

He agreed wholeheartedly with the belief that much mental disorder is preventable; the fatalistic attitude of the public was pathetic but the apathy of the medical profession was harder to understand. The influence of stresses upon the mind was as important with the normal man as with the abnormal, and the mental reaction might be the determining factor in recovery from any condition. The study of the mind was a study of interaction and relationship. Granted that inherited tendencies largely determined the danger areas in any given mind, the physician should try to find what stresses might reinforce that tendency so as to make it operative. One of the most important potential factors in the production of mental disorder was variation in sensitivity. Hypersensitivity was frequently associated with weak inhibition or lessened control, and might be followed by physical or mental changes. On the mental side the changes would be in the emotions and would carry inevitable bodily changes with them. It was therefore most important to treat the hypersensitivity before the emotions became involved. Certain types of children could be kept continuously on small doses of bromide; grs. 2½ for a child under 4 and twice that amount for one over 4. Children who were almost uneducable from their over-reaction to stimuli might, under this treatment, become quiet and teachable. If the dose were withdrawn they would regress slowly, sometimes even developing epileptic fits. This suggested that small regular doses of bromide might be prophylactic against epilepsy. In the same way, grs. 5 of bromide a day might be most valuable for tropic-dwellers and for certain types of active men and women. Pavlov, in his work on the conditioned reflexes in dogs, had remarked:

"It must be noted that as a result of the administration of bromides there was no diminution in the magnitude of the positive reflexes; on the contrary, they were extremely constant. According to these and all previous expetiments bromides should not be regarded as sedatives diminishing the excitability of the central nervous system; they simply regulate the activity of the nervous system by strengthening the intensity of internal inhibition."

The President's clinical experience supported this view. A small dose of bromide taken regularly over many years did not diminish the mental powers but in fact increased them, no doubt through preventing wastage. In larger doses bromide could be an extremely toxic drug, and its beneficial effects were lessened or destroyed. There was much to support the view that mental disorder was often due to the weakening of lowered inhibition and not to any positive condition. When the inhibitory function had become weak the emotions became involved, and this in turn caused preoccupation and false reasoning, and in time failure of adaptation to environment. All this was accompanied by corresponding physical changes, and after weeks or months it might be difficult to decide the initial cause of the mischief. Clinical experience favoured a sceptical attitude towards the endocrine system as primary cause; the changes in the vegetative nervous system were usually secondary, although when established they might have an important bearing on the illness. Accurate and careful case-taking was essential in seeking the first cause. Here as in everything else there were many sides to truth, and each physician tended to find his own specialty dominant. Much might be done to localise an illness by pointing out to the patient the dangers of false reasoning about his symptoms, the direction in which his reasoning would lead him, and the beginning from which false reasoning had arisen.

Insomnia.

The fact that healthy people could do without sleep at will, he said, did not mean that sleeplessness was harmless to everybody; it was for the physician to discern those who were likely to suffer seriously. There was much experimental and physiological evidence for the importance of sleep. Pavlov had distinguished two types of neurotic dog—in one the inhibitory function, and in the other the excitation of the cortical elements was affected. In the maniacal patient hypnotics were of little use and even seemed to increase the excitement, while the patients recovered spontaneously if left alone—like Pavlov's second type of dog. But in the other kind of patient sleeplessness was quickly corrected by suitable methods. Addiction was an extremely rare sequel to the prescription of ordinary sedative drugs, and the addict was usually a person from whom hypnotics had been withheld until he had reached a state of terror; it was to avoid a repetition of this terrifying experience that he clung to his drug. The term "addiction" most certainly ought not to be applied to a person who took a sedative every night on medical advice and thus preserved sleep, good health, and full mental activity. "Sleeping draught" was another term used incorrectly; properly it could only be applied to amylene hydrate and paraldehyde, which would produce sleep whenever they were given. The barbitone group, for instance, caused no desire for sleep if given in the daytime, and further research might show that their action was to strengthen a weakened inhibition, and that sleep was only a secondary result. Patients who showed evidence of exhaustion with defective sleep, due either to advancing years or to prolonged over-stimulation of the nervous system, might have their mental stability strengthened, so that their activity of mind remained on a high level for many years, by taking a small dose of dial or medinal every might. There was no evidence of any deleterious effect. Sedatives should be given over prolonged periods, and there was never any difficulty in withdrawing them when required. Daily medinal might moderate the phases of a manic-depressive mental disturbance.

The seriousness of insomnia in children was seldom fully appreciated. In some it would cause nutritional and digestive disturbances, in others emotional difficulties or mental confusion, and in course of time both physical and mental deterioration would appear. Grs. 5 of potassium bromide, with or without grs. 5 of chloral hydrate, every night for some time was excellent. Prolonged treatment was necessary to prevent relapses and induced a much higher level of physical health than short courses.

Minor mental disturbances were not uncommon after surgical operations and for their prevention sleeplessness must be relieved immediately. Some surgeons gave ½ drachm of paraldehyde per stone weight of the patient rectally on the operating table, or 1 drachm rectally an hour before the operation for very apprehensive patients, so that they never knew they were being anæsthetised. Medinal, dial, or allonal could be given with profit for some days before and some weeks after an operation, and would make convalescence more rapid and complete if the patient were at all nervous. If medical men prescribed effective sedatives for insomnia there would be less taking of drugs by patients on their own initiative. Patients did not tend to go on taking drugs after sleeplessness had been corrected.

Toxæmia.

Almost anything could act in a toxic manner, the President said, provided the nervous system were sensitive or had an "idiosyncrasy" towards it. The difficulty in diagnosis arose when the mental syndrome was not typical of toxæmia. The longer the condition of focal sepsis had lasted the more difficult and less effective treatment became. Medical

men should devote more time and study to mind reactions, for minor mental disturbances might be the earliest indication of physical disease due to some infection. Insomnia was frequently associated with toxæmia, often preceding it and allowing the toxic process to become active. Serious mental symptoms could often be prevented by treating the insomnia at once. Each person had his own way of reacting to stress, internal or external, mental or physical. Much false reasoning or rationalising resulted from the failure of the doctor to explain the mental condition or to appreciate the morbid sensibility of the patient. If the faulty attitude of a patient to stress was due to weakened inhibition it was unnecessary, and might be harmful, to spend months in tracking the original cause. Psychological medicine would gain from making the language it used more simple. Clinical experience had, year by year, driven the speaker back into general medicine. To him the theory of weakened inhibition explained so much: why certain brilliant children or adults broke down and why at first there was no interference with their normal mental activity, which only became involved as sleep and other bodily functions became affected; why a toxæmia might affect the nervous system of certain people; why a breakdown might follow surgical operation; why some people broke down from over-stimulation or with advancing years; why some persons relapsed when certain treatment was discontinued; why treatment should at times be continuous and why patients might remain in good health and full mental activity for many years under treatment. Research from that standpoint would bring about much knowledge of value in prevention and treatment of "functional nervous disorder."

COMBINED SECTIONS OF THERAPEUTICS AND TROPICAL DISEASES.

THE SPECIAL USES OF ANTIMONY.

A JOINT meeting of these Sections was held on Nov. 13th to discuss the special uses of antimony. Prof. J. A. GUNN, President of the Section of Therapeutics, who took the chair, said that Valentine, who was largely responsible for the introduction of antimony in modern medicine, stated that one man's life was too short to become perfectly acquainted with all its mysteries. It had become clear, said the chairman, that even the 300 years which had elapsed since then had not sufficed for the discovery of all the mysteries of antimony.

Dr. J. B. CHRISTOPHERSON, in opening the discussion, first dealt with the question of the early use of antimony. In England it was of but little account as a medicinal agent until the sixteenth century, but it had figured in an interesting way in the evolution of medicine since remote times. First it was used as a cosmetic, and later as a medicinal application for the eye. From 1500 to 1825 in this country people used antimony empirically for many diseases; and from 1905 to the present day could be looked upon as the period of its scientific administration. It belonged to the same chemical group as nitrogen, phosphorus, bismuth, and arsenic. The close chemical relationship between antimony and arsenic led to the idea that their biochemical reactions were similar. The Assyrians found the metal near Ispahan in Persia, and were the first to use it as an article of female adornment. It was still used by Arab women, by whom it was called the eye-paint. Doubtless the Assyrians taught the Israelites how to use eye-paint. Certainly it was used a long time ago for the treatment of granular eyelids, also as an astringent for eye discharges, for ulcers, burns, recent wounds, and dog-bites. In the sixteenth century Paracelsus introduced antimony into medicine, and he strongly recommended its use for the plague, under the term "mercurius vitæ," though it contained no mercury. It was in 1604 that antimony found a place in the British Pharmacœpia. In 1619 "the Earl of Warwick's powder," containing antimony sulphide, appeared in Italy, and this was the precursor of tartar emetic, the most important of the antimony derivatives. Louis XIV., when 19 years of age, was seized by an illness which baffled the physicians, but a quack was said to have cured him by giving him tartar emetic. Following a violent controversy concerning the drug in 1566, it was banished from medicine for a hundred years. In 1822 Prowse obtained the sesqui-oxide of antimony, and there were two famous antimony preparations, James's powder and Plummer's pill. Pulv. antimonialis was the official substitute in 1787, and it was still in the 1914 British Pharmacœpia.

In 1906 two workers in the Pasteur Institute, Paris, proposed the use of antimony salts for trypanosomiasis. In the same year Plimmer and Thompson, at the Lister Institute, tried, on the suggestion of Cushing, antimony potassium tartrate. Of all the various drugs used for trypanosomiasis, sodium antimony tartrate had the most marked influence on the disease in the human body. Its first use was by subcutaneous injection, but sloughing and the formation of abscesses followed. And oral administration did not prove more satisfactory. In 1906 a very important discovery was made—namely, that antimonium tartrate could safely be injected intravenously, and cases of cutaneous leishmaniasis were cured by potassium antimony tartrate. In 1915 cases of kala-azar were cured with it in Sicily, and this was repeated by Sir Leonard Rogers in India and Dr. Aldo Castellani in Ceylon. The speaker himself, in 1917, had investigated the action of potassium antimony tartrate in bilharzia. In 1913 two workers in Brazil had successfully treated granuloma inguinale with potassium antimony tartrate intravenously, proving the important fact that it was efficacious not only in two protozoal diseases, but was also a specific in a bacterial infection. Later it was shown to be specific for a helminthic affection too. It was probably specific for rhinoscleroma, which was caused by a diplococcus of the Friedländer type.

THE PRESIDENT said his personal experience with antimony compounds was only slight. The use of antimony for specific diseases was largely a matter of the last 20 years. In early times it seemed to have been used for every known disease, and this greatly reduced the credit attached to the observation of which ailments it seemed to benefit most. In its earlier use it was mixed with such a variety of compounds and was prepared in so many ways that one wondered whether some such form as that employed to-day was not happened upon. Research on antimony had gone on pari passu with research on arsenic. In the case of arsenic the pentavalent compounds had first been tried, then gradually the workers had passed on to the trivalent ones, such as salvarsan. The reverse order was followed in regard to antimony. It had been shown that if a compound did not act on trypanosomiasis it probably would not act on bilharzia. Trial with other substances in place of tartaric acid—such as citric or lactic—did not give better results. Lithium had now largely replaced the potassium salt. The substitution of ethyl had given good results in trypanosomiasis. The first pentavalent compound which was made was an analogue of atoxyl. It was tried in trypanosomiasis, but it was no better than potassium antimony tartrate. The next preparation made was stibenyl; this was tried in leishmaniasis and in experimental trypanosomiasis. It was effective, but the results were not dramatic. Next, one of the hydrogen molecules was replaced by chlorine, and the substance was named stibosan, the von Heyden "471." It was a distinct success. Urea compounds had also been made. One was stibol. A substance used a good deal now was stibamine glucoside, and there was no doubt about its efficacy in kala-azar. For the latter disease the best drug was considered to be "693." Attempts had also been made to combine antimony with dyes; it was said that only the compounds which stained trypanosomes were active. There had not yet been any report made about their

action on man. He asked whether any member had used antimony per rectum.

Dr. GEORGE LOW first spoke of the successful experiments of Plimmer on rabbits infected with trypanosomiasis. But when antimony was injected subcutaneously in man the local reaction was so severe that it had to be discontinued. It was then given orally, but the vomiting which followed administration of a large dose ruled that method out. On the Congo, where many were dying of sleeping sickness, it was tried intravenously, in small doses at first. The expected sloughing of veins did not follow, and by gradual increments massive doses could safely be given. Even grs. 2½ to 3 could be given without causing more than a cough. It was next tried in leishmaniasis, and Castellani used it with success for kala-azar in Ceylon. Then came the great discovery by Christopherson of the efficacy of the metal in bilharziasis. When the speaker began to study tropical medicine, bilharzia showed a high mortality, but Christopherson's discovery brought the figure down greatly. Large doses, however, must be given. For ulcerating granuloma a total of grs. 54½ would bring about a complete cure in one case, while in another this did not ensue after grs. 114. Of the various derivatives he had used, the one he liked best was stibamine glucoside. Neostam could be used intramuscularly for children without harm.

Dr. PHILIP MANSON-BAHR said that the new pentavalent compounds had no effect on *Schistosoma hæmatobium*. The more poisonous the compound used, the more effective it was against schistosomiasis. Antimony killed off the bilharzia worms by a slow and painful process; it was specific for the ovarian tract of the female worm, and neutralised its egg-laying capacity first, and then the worm slowly died. Good results were not claimed for the pentavalent compounds in schistosomiasis. The new pentavalent compounds, if exposed to great heat before being injected, were rendered practically useless. An important point was told to him by Dr. H. M. Hanschell—namely, that if antimony was dissolved in a 5 per cent. glucose solution, many of the poisonous effects were thereby obviated. Many patients complained so much of rheumatic pains after injection that further injections were rendered almost impossible, but since he adopted Dr. Hanschell's advice, he had not heard such complaints. It was a distinct advance in technique. Some kala-azar patients seemed to be antimony-resistant—i.e., no dosage cleared up the illness. In such cases Dr. Manson-Bahr advocated a trial of them all in turn until the particular efficacious one was found. Even six-tenths of a gramme (nearly grs. 8) should be given. The reaction was grave, but afterwards the clinical improvement was obvious. A curious fact, of which he had not seen any explanation, was that Leishman-Donovan bodies could be recovered and grown in culture almost up to the time of the patient becoming quite well of his disease. He had had a case of ulcerating granuloma, lasting three years, in which grs. 300 of antimony tartate was given, the final result being good. In this disease the pentavalent compounds of antimony were more valuable than the original tartar emetic.

Dr. ALDO CASTELLANI said he believed he was the first to use antimony in the treatment of Indian kala-azar. Previously he had used tartar emetic in other diseases, for instance, in yaws. He had also employed it in bronchospirochætosis, the existence of which some denied, and found it very useful. He mentioned that he had been carrying out investigations into the closely allied element phosphorus. The great difficulty concerned its method of administration. The oral route was very unsatisfactory, but it could be used conveniently by the subcutaneous method if the phosphorus oil of the British Pharmacopœia were employed—i.e., 2, 3, 5, up to 10 ♏ of the phosphorated oil. It produced no pain. In chronic malaria it was an adjuvant to quinine, and he advised it in rickets and osteomalacia, with good results. He had also used it in dermal leishmaniasis, and in most of the cases phosphorus answered better than antimony. If there was no ulceration 5 ♏ was the quantity injected twice a week. When the nodule was ulcerated, the technique was very simple; the ulcer was cleaned up and a few drops were let fall on the fundus of the ulcer from a glass rod.

Dr. H. B. DAY said he had seen many thousands of cases of bilharzia treated by Dr. Christopherson, and he knew of no instance in medicine in which one could so intimately and accurately follow the therapeutic result. The progress could be watched day by day under the microscope. He described the progress of a serious case from the time it was first seen to its ultimate cure, remarking on the importance of concentrating treatment in the first week.

The opener briefly replied.

BRIGHTON AND SUSSEX MEDICO-CHIRURGICAL SOCIETY.

AT a meeting of this Society on Nov. 1st, with Mr. GEOFFREY BATE, the President, in the chair, Mr. St. G. B. DELISLE GRAY read a paper on the

Injection Treatment of Varicose Veins.

He began by outlining the anatomy of the superficial veins of the lower limb as described by Kosinski,[1] and said that the anatomical factors making for varices were: (1) The height of the column of blood, the average length of the great saphenous vein being 85 cm.; (2) the thinness of its walls and lack of muscular support; and (3) possible variations in the anatomical course of the small saphenous and its anastomotic channels. The first intravenous injections of drugs had been made on animals in 1657, at the suggestion of Sir Christopher Wren, the architect of St. Paul's Cathedral, but intravenous therapy had been impracticable until the invention of the Pravaz syringe in 1851. Shortly after this date experiments had been made with the injection of solutions of ferric chloride into varicose veins; there had been many successes, but also many failures due to septic sequelæ, embolism, and the like. During subsequent years various solutions had been used for injection, and there had been many successful cases, although some caused great pain to the patients, whilst others caused sloughing, scarring, and recurrence. He himself had found that sodium salicylate caused severe pain, though admittedly the results were excellent. He now used quinine and urethane, and always gave the injections with the patients standing up. He saw no reason for injecting the fluid slowly, as it must surely militate against the success of the injection if the fluid became diluted. In women it was important to exclude pregnancy as a cause or a concomitant of varicose veins, as the injection of quinine might possibly lead to abortion. After giving an account of a series of experiments at the Mayo Clinic by L. G. Rowntree and Takuji Shionoya,[2] with the object of directly observing thrombus formation, he drew attention to the fact that most solutions used in the injection treatment of varicose veins were self-sterilising. In the treatment of hæmorrhoids he used 20 per cent. carbolic acid, and he suggested that similar fluids might be injected into subcutaneous nævi, and that varicocele might be amenable to treatment by injection. The alleged risk of quinine blindness after injection of quinine he regarded as negligible.

After reading the paper, Mr. Gray showed a table designed by himself for the patient to stand on, and demonstrated two cases.

Dr. H. M. GALT showed microscopical slides illustrative of changes in the vessels.

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[1] Jour. Anat., 1926, lx., 131.
[2] Jour. Exper. Med., 1927, xlvi., 7, et seq.

Reviews and Notices of Books.

THE PRACTICE OF REFRACTION.

By W. S. DUKE-ELDER, D.Sc. St. And., F.R.C.S., Assistant Ophthalmic Surgeon, St. George's Hospital; Assistant Surgeon, Royal London Ophthalmic (Moorfields) Hospital. London: J. and A. Churchill. 1928. With 208 illustrations. Pp. 410. 12s. 6d.

Mr. Duke-Elder says in his preface, and we agree with him, that most of the principles of optics, so far as the clinical practice of refraction is concerned, can be understood and appreciated in non-mathematical terms. With this end in view, he has succeeded in producing a thoroughly practical book which should be of great use to students, who are referred for a more complete presentation of the theory to the current works of Charles Goulden and A. S. Percival. There are still some questions connected with the practice of refraction as to which authorities are not unanimous. One of these is as to whether or not the ciliary muscle can act unequally in altering the curvature of the lens in different meridia, or whether it always acts on all meridia equally. The matter is not one of merely theoretical interest, for on it depends the rationale for the correction of small errors of astigmatism. It is now generally held that in certain patients suffering from headaches this correction is a matter of great importance. Ernest Clarke attributes such symptoms to the strain to which the ciliary muscle is put in contracting unequally in order to correct these small errors. Duke-Elder denies this. Yet he says that the form of the lens when relaxed under atropine is completely different from that found in the accommodated or partially accommodated state. If this is not due to unequal ciliary contraction how, then, is it caused? The answer, according to Duke-Elder, is by an alteration in the shape of the anterior surface of the lens when the tension of the capsule is relaxed, this surface becoming not only more convex but paraboloid, and a lenticonus being produced. In this way, he says, a minute amount of astigmatism which may be found under cycloplegia and mydriasis will no longer exist when the effect of the atropine has worn off, and since the object of glasses is to correct the errors of refraction present when the eye is in its normal condition, the correction of these small errors which are only found under atropine is contra-indicated. It will be seen that the difference of view of Duke-Elder on the one hand and Ernest Clarke on the other is fundamental. There is no question but that in cases where there are no symptoms, and where the correction of a small error of astigmatism does not improve the natural vision, such correction is unnecessary and unwise, but, on the other hand, where there are distressing symptoms, such as headache, in nervous or highly strung patients, the experience of most modern ophthalmic surgeons is that it is amply worth while for the patient to wear glasses correcting his slight error, even though the improvement in vision may be negligible. If this is true, what can the explanation be except strain caused by unequal contraction of the ciliary muscle?

As to the methods of testing for glasses, Duke-Elder rightly lays the principal stress on retinoscopy, an art which, as he says, requires much painstaking practice, and cannot be learnt in a day. To determine the correct axis of astigmatism the advice is given to study the shadow when the appropriate sphere and cylinder are both in the trial frame. For exact work the position of the source of light, the choice between concave and plane mirror, the size of the hole in the mirror, and whether the hole is pierced or merely left unsilvered, are all matters of moment. Authorities are by no means agreed as to these details, and the learner should carefully compare their teachings and test them by his own practice. In cases of oblique astigmatism much can be learnt by observing the changes in the obliquity of the shadow when one meridian is slightly under- or over-corrected. We do not exactly understand the author's meaning when he suggests that in certain cases the two meridia are not at right angles to each other. As to subjective tests, the recently introduced "duochrome" is explained, a test which depends upon the fact that the short blue waves of the spectrum are refracted more acutely and brought to a focus sooner than the long red waves. Readers are enjoined to make careful tests in cases of presbyopia and not trust to mere routine in this matter. Heterophoria is adequately but not exhaustively dealt with, and the explanation of the amblyopia of convergent squint leaves something to be desired. There is a useful chapter on the making and fitting of spectacles in which the rather difficult subject of decentering is dealt with, as also distortions due to tilting, tinted and protective glasses, and so forth. The appendices include useful tables reproduced from Percival's latest edition, and an up-to-date list of official visual requirements.

PRACTICAL SURGERY OF THE ABDOMEN.

By GEORGE H. JUILLY, M.D., Chief Surgeon to the French Hospital, San Francisco. In 2 volumes. With 1291 illustrations. Philadelphia: F. A. Davis Company. 1928. Pp. 1275. $16.

THIS is a manual for the practical clinician and presents a picture of what the surgeon sees in his everyday work. There is no systematic account of pathology, but the significant features of diseases are considered, together with important points which lead to a true diagnosis and anatomical facts which have a bearing upon surgical treatment. The author lays great emphasis upon the necessity for arriving at a correct diagnosis when possible, and stresses the importance of regarding the body as a whole in relation to its local diseases. His style is easy and attractive, in places almost conversational. The methods described are those he himself employs and relies upon; where he gives an account of a procedure of which he has no personal experience he makes a special note to that effect, and this candour inspires confidence. There are many interesting things and good pieces of advice in the book—for example, the recommendation to examine carefully the excised gall-bladder, to ensure that no damage has been done to the common duct before closing the abdomen, and the need for caution when at an operation for gall-stones the gall-bladder appears normal to inspection. The suggestion that gastro-jejunal ulcer is the result of too large a stoma is worth consideration, and a number of other useful points will be discovered by the reader. Some of the advice offered will not be universally acceptable, such as the use of the stomach-tube before gastric and gall-bladder operations, the advocacy of the Bevan gall-bladder incision, and Y-gastro-enterostomy. The author makes out a very good case for the combination of urinary and abdominal surgery, believing that specialisation has gone too far for the good of the patient, and he includes in his second volume an account of urinary surgery and of abdominal gynæcology. The illustrations are numerous. The majority of them are poor works of art, but they have the merit of explaining quite clearly the author's meaning.

POST MORTEMS AND MORBID ANATOMY.

Second edition. By THEODORE SHENNAN, M.D., F.R.C.S. Edin., Professor of Pathology in the University of Aberdeen. London: Faber and Gwyer, Ltd. Pp. 664. 25s.

THIS book has been recast with a view to making it a text-book of special pathology as well as a manual for use in the post-mortem room. The arrangement of the subject matter corresponds, for the most part, to the order in which a post-mortem examination is conducted. It remains pre-eminently a book in which the author describes what he himself has seen. For

example, the section on bone-marrow gives the real facts as to the replacement of red marrow by yellow and discusses the chloromatous infiltration of the marrow sometimes seen in acute leukæmia. Many subjects—for example, gastric ulcer—are admirably dealt with in a relatively small space. Brief pointed descriptions are given of argyria, industrial benzene poisoning, and poisoning by arseniuretted hydrogen and tetrachlorethane; these are missing in most post-mortem manuals of this size. The classification of nephritis is not good and the whole section dealing with this subject should be rewritten. It is almost incredible that we should be asked to believe that nephritis occurs in forms so varied as acute parenchymatous, acute interstitial, subacute parenchymatous, subacute interstitial, chronic parenchymatous, and chronic interstitial.

Apart from this our criticisms are merely of details. The statement that Addison's disease "depends upon inadequacy or diminution of the chromaffin cells" implies that the suprarenal medulla is essential to life, whereas all the modern evidence goes to show that this honour belongs to the cortex alone. No mention is made of carcinoma of the suprarenal cortex associated with sexual precocity. We challenge the statement that "in young individuals the coronary arteries may show syphilitic (proliferative) endarteritis." When syphilis affects the coronary blood-supply it does so by blocking the coronary orifices as a result of syphilitic aortitis. The section on carcinoma of the lung is good, but syphilis of the lung is given undue prominence considering its rarity. In the discussion on familial hæmolytic icterus the statement is made that "there are no apparent structural alterations in the bile-ducts," but the important fact that gall-stones are found in 60 per cent. of cases is not mentioned.

The book is well printed on good paper, and profusely illustrated.

LYON'S MEDICAL JURISPRUDENCE FOR INDIA.

Eighth edition. By L. A. WADDELL, C.B., C.I.E., F.L.S., M.B. Calcutta and Simla: Thacker, Spink and Co. London: W. Thacker and Co., 2, Creed-lane. 1928. Pp. 812. Rs.20=£1 13*s.* 4*d.*

THIS book has passed through eight editions in forty years and holds a high position in medico-legal circles. It is written principally for India, but it deals also with the various legal enactments and conditions in this country. In this edition the author has had the assistance of Lieut.-Colonel T. F. Owens (Rangoon), who has revised a great part of the work, and also of Lieut.-Colonel R. B. Lloyd, who is responsible for the chapter on blood stains. The student will find the book a most useful guide to the practice of forensic medicine in India. A considerable amount of new matter has been added, and the chapters on wounding and on the examination of blood stains have been greatly improved. In these chapters, however, a few points needing revision have escaped attention. The statistics are almost uniformly long out of date, and some of the various enactments of medico-legal interest of the past few years have not been noted; for example, the Infanticide Act (1922), the Administration of Estates Act (1925), or the Law of Property Act (1925), although the latter two statutes have completely altered the questions of survivorship and tenancy by courtesy which are discussed at some length in the book. The description of the poisons of special moment to practitioners in the East remains one of the most interesting parts of the work. In the general toxicology section, while certain parts have been well revised, others have been unaccountably neglected; the article on Cannabis Indica, which has a certain importance in India, is left as it was written by Lyon himself in 1889. Reagan's test, which is in regular daily use, is not mentioned, and the statement is made that there is no chemical test for the substance. A further example of lack of revision is seen where veronal is described as "a dangerous new drug," although it is 25 years since it was synthesised by Merck. The section on the organic compounds of arsenic would bear expansion. The organic compounds of antimony are not mentioned at all, and although tartar emetic must have been employed in India for a considerable time for the treatment of bilharzia, it is not referred to in this connexion. The article on the Stas Otto process is excellent. A new feature is the insertion of photographic illustrations, for the most part very good, of various types of injury, which add greatly to the value of the work. The omissions to which we have drawn attention do not to any considerable degree detract from the usefulness of the volume, which must be considered the foremost work on Indian medical jurisprudence.

ELEMENTARY PATHOLOGICAL HISTOLOGY.

By W. G. BARNARD, Pathologist to University College Hospital, London; Formerly Junior Assistant Director of the Institute of Pathology at the London Hospital. London: H. K. Lewis and Co., Ltd. 1928. Pp. 70. 7*s.* 6*d.*

THIS book is practically an atlas. It consists of 176 illustrations, and contains only as much letterpress as serves to explain the figures. Technique is not dealt with at all. Although in a work of this size complete and detailed treatment of the subject is out of the question, the author has covered a surprising amount of ground. A description of the general phenomena of inflammation and repair is followed by sections dealing with the more characteristic infectious lesions. Certain degenerative processes and vascular lesions come next, and lastly the tumours. The descriptive matter is lucid and dogmatic, as it should be in a book of this type, and the illustrations are really admirable. The majority of them are photomicrographs, and it is obvious that great pains have been taken in the selection of preparations and the choice of "fields." Nearly all of them are clear and sharp, and though one or two fall a little below the general high level, they really do fulfil the purpose for which they are intended.

Dr. Barnard is to be congratulated on a book which will certainly be deservedly popular with students. It is beautifully produced and inexpensive.

CLASSIFICATION OF HEART DISEASE.

Criteria for the Classification and Diagnosis of Heart Disease. By a Committee: JOSEPH H. BAINTON, M.D., ROBERT L. LEVY, M.D., W. C. MUNDY, M.D., M.C., U.S.A., HAROLD E. B. PARDEE, M.D., Appointed by the Heart Committee of the New York Tuberculosis and Health Association. New York: Paul B. Hoeber. 1928. Pp. 91. $1.50.

THE American Heart Association is performing a useful function in collecting information about heart disease from all parts of the United States. In work of this kind it is essential that different people should apply the same name to the same condition. To provide such a uniformity of nomenclature and to define the terms used is the object of the present volume which has been written by a committee of four, appointed by the Cardiac Section of the New York Tuberculosis and Health Association. The task can have been no easy one, and the committee deserves praise for its achievement. The book follows the general scheme adopted by the American Heart Association in dividing the subject of diagnosis into four main categories—anatomical, physiological, ætiological and what, for want of a better term one, might call "economic." To define the limits of normal variation has doubtless been one of the most difficult problems which the authors had to face, and in this matter they are bound to meet with a considerable amount of criticism. For example, on p. 80 it is stated that hypertension may be diagnosed when the systolic pressure is above 140 or the diastolic above 90. These figures are too low; 160 and 100 are the lowest values which would be accepted by most

cardiologists. Again, in speaking of cardiac enlargement (p. 37), the statement that "The left border of the normal heart does not usually lie more than 1 cm. to the left of the mid-clavicular line" is surely an error in the opposite direction. In adults the mid-clavicular line is a liberal estimate, and 1 cm. beyond it would generally be accepted as undoubted evidence of cardiac enlargement or displacement. These, however, are merely isolated points, and taking the book as a whole there is very little matter for criticism.

PIONEERS OF SCIENCE.

Seven Pictures of Struggle and Victory. By AMELIA DEFRIES. London: George Routledge and Sons, Ltd. 1928. Pp. 189. 5*s*.

THE contents of this book are divided into two parts, the first dealing with the living, "by whose wisdom we progress," and the second with the dead, "by whose light we live." The first forms the major part of the book: it consists of sympathetic studies of the life and work of four men of genius. These are Sir Jagadis Bose, F.R.S., the Indian botanist; Patrick Geddes, the biologist; Victor Branford, the sociologist; and Nicholas Roerich, the Russian painter. The second part is devoted to short sketches of the lives and discoveries of Sir Francis Bacon, Sir Humphry Davy, and Faraday. The choice of heroes is somewhat arbitrary. No doubt the world owes much to Sir Francis Bacon, but in pure science, considering the age in which he lived, Roger Bacon has perhaps an even greater claim to attention. The author is evidently imbued with the statement of Bose, that "the excessive specialisation of modern science in the West has led to the danger of losing sight of the fundamental fact that there can be but one truth, one science, which includes all branches of knowledge." The Indian belief, current for more than 4000 years, that whenever the country is in need the redeeming spirit will be reborn; "whenever the dharma decays and adharma prevails, *then* I manifest myself. . . . I am born again and again" is the main theme of the first part of the book.

MANUAL OF ZOOLOGY.

Sixth edition. By L. A. BORRADAILE, Sc.D., Fellow and Tutor of Selwyn College, Cambridge, and Lecturer in Zoology in the University. London: Humphrey Milford, Oxford University Press. 1928. Pp. 683. 16*s*.

IN this edition considerable alterations and additions are made in the chapters on sex, embryology, and evolution, and a concise account of helix is inserted. Minor additions, corrections, and alterations relate to amœba, anodon, archæopteryx, paramecium, the nervous system of raja, and so forth. There are some 25 new illustrations.

From the foreword we learn that the author intends the book for the instruction of students working (*a*) for a preliminary medical or some similar examination, and (*b*) taking a wider course or a general course in zoology. For the latter class of student the book is excellent. For the medical or veterinary student the book is good in so far as it is dealing with the protozoa in general, the annelida, arthropoda, and vertebrata, but those sections intended as a link between zoology and the later medical studies might with advantage have been enlarged. Such sections are of vital importance not only in the curriculum of the medical student, but in that of the veterinarian. They are not sufficiently accurate in detail for students. For example, on p. 223, in speaking of the liver fluke, we are told "the cercaria, making its way up the bile-duct, grows into an adult fluke." The liver fluke is spoken of as the *Distomum hepaticum*, whereas the student in his later years will have to speak of it as the *Fasciola hepatica*. The same remark applies to trichocephalus and its now accepted name of trichuris, *Ancylostomum duodenale* for *Ancylostoma duodenale*, and so forth. On p. 151 we are told that in fission in the trypanosomes "the flagellum . . . is doubled, in division," but this is not in accord with modern knowledge. The same may be said of the statement on p. 151 that "latent bodies" in the trypanosomes "probably can increase by binary fission."

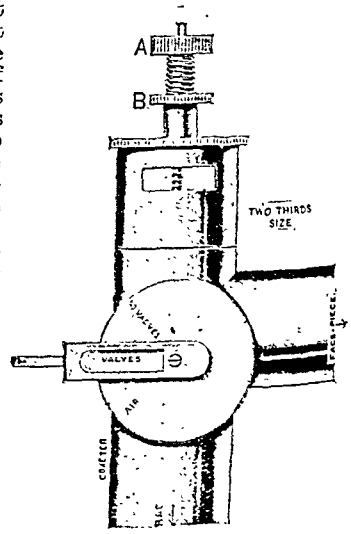
If these sections were carefully revised and supplemented the book would become a most useful text-book for medical students. Without adding more than a few pages it could also be made completely adequate for the needs of veterinary students, for the medical and veterinary courses have much the same requirements in this respect. We are told on p. 147 that *Entamœba histolytica* "inhabits the human intestine," but it is as important for the medical man as the veterinarian to know that this parasite is also found in dogs. On p. 224 the schistosoma is referred to as a parasite "which lives in the veins of man"; this might read "which lives in the portal veins of man and animals." Mosquitoes, lice, and house flies are dealt with, but the important tsetse-flies and bot flies are neglected.

In spite of these omissions the book will be found extremely useful, and the illustrations are excellent.

New Inventions.

AN ADJUSTABLE SPRING-LOADED EXPIRATORY VALVE.

THERE are many occasions in surgery when the anæsthetic of choice is nitrous oxide and oxygen given under pressure. For example, one or both pleural cavities may be opened without the occurrence of dyspnœa if differential pressure is employed. Several somewhat complicated American machines enable the anæsthetist to use positive pressure with or without rebreathing, but with the simple sight-feed type of apparatus such as the "Boyle," it is only possible to obtain pressure with complete rebreathing. The object of the valve here illustrated is to enable a continuous pressure to be used with any desired amount of rebreathing or with none at all. The valve will be seen to resemble the standard 3-way attachment except that the simple expiratory flap-valve is replaced by a spring-loaded blow-off, the tension of the spring being regulated by the knurled nut A which, in turn, is fixed by the lock-nut B. The pressure at which the expiratory valve opens can be seen by the manometer on the gas-oxygen machine, and can be varied from practically nil to 15 mm. Hg. It is rarely necessary to exceed 10 mm. Hg, and this pressure can be maintained without unduly distending the bag if this is made of rubber sheet, gauge 8 (instead of the usual gauge 10 for a 2-gallon bag). The internal construction of the 3-way mechanism has also been modified so that there is no restriction in the size of the gas-way in positions of partial rebreathing.



The valve was made at my suggestion by Messrs. Coxeter and Son, Ltd., 171–5, Pancras-road, London, N.W., and has proved quite satisfactory in practice.

C. LANGTON HEWER, M.B., B.S. Lond.

HE LANCET.

: SATURDAY, NOVEMBER 17, 1928.

) DAUGHTERS OF ÆSCULAPIUS.

G's speech at the opening of the Parlia-ssion last week foreshadowed changes in ment which would in the opinion of the the Crown enable better provision to the health of the people. In the text l Government Bill which has just been ere are more than a hundred clauses, ich bear directly or indirectly on the th. The important provisions are a memorandum issued by the Ministry which a summary is given on p. 1048. clear, what was before generally antici-the large poor-law institutions are over and developed by the munici-hich they are situated. Within a few county, every county borough, and the larger urban districts will find ddenly in a position of having hospitals or the treatment of the sick in addition nt equipment of beds for the isolation disease and other purposes that were entive in intention. Figures can give conception of the opportunities for cine which this reshuffling is to bring pe of local authorities and their health ut we may remind our readers that ir for which figures are available there ds in the separate poor-law infirmaries 9,876 beds in the sick wards of poor-s. Nor are these infirmaries in large character associated with the poor-: from most of them the stigma of faded away more or less completely, l equipped and staffed, in some the of disease and the appointment of ready an accomplished fact. Moreover, resources might be said in a way to be l the stroke of a pen, without the need d builder, with scarcely time to think e gift signature to them, all these new ll into the laps of the local authorities. in the life of the community, for the is the factor on which other social and the acceptance by electors of or curative and preventive medicine l to have a far-reaching effect on the . It is in effect the situation which ter of Health had in mind when in ence the amendment he appointed a [illegible] Dawson as their [illegible] the extension [illegible] The twenty [illegible] only [illegible] a [illegible] and may be [illegible] of curative and [illegible] It is [illegible] be [illegible]

implemented is embodied in a report[1] which should be studied closely in relation to the situation of the moment.

Unity of local control is then as good as achieved, but what about the coördination of preventive and curative medicine? Has the controlling authority as constituted the qualification, let alone the will, to bring it about? ÆSCULAPIUS, we are told, had two daughters, HYGEIA and PANACEA, who assisted in the temple rites and fed the sacred snakes. It is not recorded whether there was any rivalry between them, but HYGEIA's modern counterpart has a large retinue of public health services whose number is growing from year to year, whereas PANACEA, whose opportunity should have come with the National Insurance Act of 1911, has been baulked again and again by the refusal to grant her the hospital and laboratory services which were her rightful heritage. It should be the function of the new type of health authority to see that there is no antagonism between HYGEIA and PANACEA, an end which can hardly be obtained without the very widest and fullest representation on the local health committees of those interests which are to be transferred to them. We are not here concerned with professional interests. We have it on the word of the Surgeon-General of the United States that while people in America are interested in obtaining health they are not much interested in the method of obtaining it, and not at all interested in the present or the future of the medical profession. And the same may be true in measure here. But it must be clear to all who are practically acquainted with local government in this country that the non-elected element on municipal committees has contributed vitally to the breadth and success of the work. Coöpted members on child welfare committees have brought in with them the pioneering efforts of voluntary associations. In rural districts the guardians have had an intimate knowledge of conditions and environment which has enabled them to do wonders with penurious medical equipment, in the same way as the personality of individual guardians of the poor has taken the work of the boards right out of the narrow frame in which it was set by statute. There is no better example of the personal and non-official coöperation in a great public health institution than in the extraordinary success of the Metropolitan Asylums Board which has pooled the resources of the several poor-law authorities in the London area and transcended the possible sum of their activities. If the boards of guardians are abolished and no opportunity is given for some of their members to serve on local health committees without going through the ordeal of a contested municipal election, the country will lose some of its best public servants and the view of the common health will be proportionately narrowed. We have mentioned only the boards of the transferred hospitals who are to be superseded, but there are other groups, such as the insurance committees, whose coöperation is as essential if all our previous experience of curative medicine is not to be disregarded. The Dawson report recommended that two-fifths of the health authority, however constituted, should be made up by the co-option of persons whose special knowledge would be of value in health questions. We repeat this as essential for the orderly development of the two great medical functions. [illegible] PANACEA and HYGEIA. One will not [illegible] with at the other.

[illegible]

THE BACTERIOPHAGE IN ACTION.

THE question whether bacteriophage is effective within the body is of much importance to practical medicine. For if so specific and innocuous an agent were to prove capable of destroying bacteria in organs and tissues as easily as under certain circumstances it destroys them in the test-tube, it would fulfil a hope that has inspired bacteriologists since ever the germ theory of disease was put forward. From the early days of its discovery F. D'HERELLE has insisted on this aspect of bacteriophagic activity and has persistently claimed for it a supreme significance in the combating of disease. It has, he thinks, a dual rôle: first, as a therapeutic agent in individual cases where it develops in the body during the illness and constitutes the natural means of cure; secondly, as playing a larger part in the control and termination of epidemics. He visualises a naturally evolving epidemic as having two phases—one in which the causal organism is spread from person to person, and a second phase in which the bacteriophage makes its appearance, being liberated in the excreta of those who have overcome the infection. Water, flies, and other agents rapidly distribute it from host to host until the whole population has been contaminated, when the bacteria become impotent and the infection subsides. The epidemic is the spread of the bacteria; its decline betokens the spread of the bacteriophage.

Whilst these views are plausible and attractive, they have not been generally accepted. D'HERELLE claims dramatic results in various epizoötics in which he has used bacteriophage as a mass remedy, but the careful work of W. W. C. TOPLEY and his collaborators in experimental epidemics of mouse typhoid has not supported the gospel he proclaims. Of more immediate interest, perhaps, to the practising physician are the results obtained in individual cases of disease. It is local infections such as dysentery, enteritis, pyelitis, and limited septic processes which lend themselves especially to treatment by the bacteriophage, and a number of scattered reports concerning them have come to hand from time to time. A large and controlled series, however, in which the agent has been extensively tried under unexceptionable conditions has been as yet wanting, and we therefore welcome two recent papers which give further information upon the subject. One of these[1] is especially valuable, as it summarises work carried out in India by D'HERELLE in collaboration with English medical officers, and under the ægis of the Indian Research Fund Association. The disease studied was cholera, and certain preliminary observations were made in Calcutta and the Punjab upon 33 patients. Twelve of these showed either complete absence of the bacteriophage from their stools at the time of admission to hospital or else the presence of a bacteriophage of slight or diminishing activity; all of them died. Five, on the other hand, had a very active bacteriophage in their stools, and they all rapidly recovered. In the remaining 16 cases a bacteriophage of feeble activity was found at the time of admission, and after showing some variation it finally became extremely potent. All these patients, also, ultimately recovered. On the strength of these and similar observations, which D'HERELLE has made in other conditions, the thesis is maintained that the presence of an active bacteriophage is essential to recovery. In the experiments designed to test this belief the bacteriophage was prepared, and the stools were examined for its presence by Dr. D'HERELLE himself, whilst Major R. H. MALONE, I.M.S., was responsible for the treatment of the patients, and Dr. N. LAHIRI for the routine bacteriological examinations. The bacteriophage was administered by the mouth, diluted in water, every two or three hours. No other special method of treatment was employed, and the patients, all of whom had rice-water stools, remained in their own homes. Among 240 control cases there were 143 deaths—a mortality of 60 per cent.—which is said to be the average in the Punjab. Among the 70 treated cases, on the other hand, there were only six deaths, a mortality of 8·5 per cent. The controls were not selected in quite the same way as the treated cases, since they included persons who refused the specific treatment and those who came under observation on days when bacteriophage was not being given; but it does not seem likely that this would introduce any factors causing a wide difference in the series. The paper describing these results also gives information bearing on the effect of disseminating the bacteriophage amongst an infected community. Its introduction into water-supplies is beset with difficulties in India, since caste and religious beliefs stand in the way. Artificial dissemination was therefore seldom carried out, but D'HERELLE and his school believe that natural dissemination will readily occur in native villages as it does in animal epidemics. Cases are cited in which cholera ceased in a village within two or three days of patients being given the specific treatment, and four instances are given in which outbreaks promptly ceased after the bacteriophage had been introduced into the wells which furnished drinking-water. The claims made are thus extremely large, and as they have now been urged, in one form or another, for several years, it is very desirable that their merits should be strictly ascertained. We know well that a number of other experimenters have got no results approaching those reported by D'HERELLE, and often they have frankly failed. The cause of this, however, is said to be the use of strains of bacteriophage of insufficient activity; and the reply seems reasonable. There is urgent need of a full investigation under conditions acceptable both to D'HERELLE and to unbiased critics. If the bacteriophage really has this therapeutic and prophylactic value in cholera, there should be no difficulty in demonstrating it on a large scale in countries where the disease is present.

The use of bacteriophage in certain other infections has recently been reported upon by H. GRENET and ISAAC GEORGES.[2] They tried it in a few cases of typhoidal disease, in which its value seemed to them doubtful. Of patients whose urinary tract was infected with colon bacilli, 11 out of 26 improved under its local and general administration, but only three got rid of their infection altogether. Bacteriophage was also used in the treatment of staphylococcal infections, and particularly for furunculosis, in which A. GRATIA has recorded favourable results. For the latter condition 38 patients were treated, mostly suffering from furunculosis of the external auditory meatus, and the results are claimed to have been "uniformly perfect," the congestion being relieved, the inflammatory swelling subsiding, and the furuncles either aborting or rapidly breaking down and healing. The bacteriophage was administered by subcutaneous injections, and as a rule the condition considerably improved after the second of these. Reaction to the injections was generally slight or absent, but occasionally local and general reactions followed. With other

[1] Bull. de l'Office International d'Hygiène Publique, 1928, xx., 1215.

[2] Presse Méd., August 29th, 1928.

septic infections the treatment did not prove so satisfactory. The investigators insist on the necessity of using strains of bacteriophage of maximal activity, and they suggest that it is more effective in acute than in chronic conditions—a view to which D'HERELLE subscribes in his more recent work.

PULMONARY EMPHYSEMA.

PULMONARY emphysema, first clearly described by Laënnec over a hundred years ago, remains a problem for the pathologist who studies its ætiology and for the clinician who essays its treatment. In the lungs of adults emphysematous islets are sometimes discovered set in the midst of healthy parenchyma. A study of these may throw some light on the pathogenesis of the condition. Thus Letulle,[1] examining the lungs of a young girl, a victim of hereditary syphilis, found minute areas of emphysema surrounding some of the smaller bronchi. Further study showed that such bronchi were affected by an inflammatory process. The airways were blocked with leucocytes, the walls swollen and infiltrated, and the elastic tissue destroyed. Peribronchial inflammation could be seen to extend to the walls of neighbouring alveoli, some of which were thickened by inflammatory products while others were atrophied. These degenerate walls surrounded air spaces which were greatly dilated. In such a case it is easy to understand how a progression of the same process might lead to emphysema of an entire lobule. Is the so-called essential emphysema identical in its origin with that which is associated with and apparently the result of peribronchial inflammation? It was the teaching of Laënnec that emphysema has its origin in a "dry catarrh" involving the bronchi and leading to swelling of the mucous membrane and the formation of thick mucus, and so indirectly to alveolar dilatation. According to this reasoning chronic bronchiolitis is the essential cause of emphysema. Clinical experience suggests that recurrent attacks of bronchial inflammation, often accompanied by bronchial spasm, play an important part in producing the emphysematous lung. Other factors may, however, be involved in its production. As shown above, a peribronchial inflammation due to syphilis may cause localised emphysematous patches in an otherwise healthy lung. A similar process may be responsible for areas of emphysema in the vicinity of tuberculous disease, though a true compensatory hypertrophy is perhaps more commonly found. Laënnec himself remarked that vesicular emphysema often begins in infancy. Letulle considers that the abundance of anthracosis in emphysematous areas supports the idea and suggests that the origin of the disease should be sought in the infections that attack the lung in early life. The stigma of sclerosis is found in emphysematous lungs and the legacy of inflammation. But this is not the whole story. Despite the extreme frequency of bronchial disease emphysema is by no means universal. He concludes, therefore, that some congenital deficiency of the lung parenchyma determines the yielding of the alveolar walls further weakened by inflammation and subjected to the stress of cough.

[illegible] the earlier day before the advent of the [illegible] were struck by the curious shape of the emphysematous chest. Some 70 years ago [illegible] proposed the theory that the pulmonary [illegible] to a deformity of the [illegible] the result of [illegible] occurring in the [illegible] to the inspiration. [illegible] all directions [illegible] the sternum [illegible] the thorax [illegible] the lungs [illegible] become permanently distended. The theory has the attractiveness of simplicity, but, unfortunately, it is not in accordance with facts. Chronic emphysema is not uncommon in childhood and may persist through adult life. The condition may be associated with a small and narrow chest as in some forms of senile atrophy. A barrel-shaped chest does not always enclose emphysematous lungs.

On the teaching of Freund the operation of chondrectomy was founded. If the emphysematous lung is the result of a dilated and rigid chest it is reasonable to restore the mobility of the chest wall and to seek to contract its dimensions in order to relieve the over-expanded lung. Hildebrandt was the first operator to apply the teaching of Freund when he performed a chondral resection in 1906, and since that year operations with a similar object have been carried out by a number of continental surgeons. A local anæsthetic is usually employed and the best results are claimed for the evulsion of the costal cartilages of the second ribs together with the perichondral membranes. In some cases the removal of several cartilages is considered necessary. Gerard-Marchant[2] claims that chondrectomy has brought relief to many sufferers and healing to a few. It must be confessed, however, that his statistics are not very convincing. A period of relief is apparently often followed by a relapse, while a post-operative mortality of 15 per cent. proves that the experiment is hazardous. Emphysema is in the main an affection that accompanies the decline of life, when remedies less bold are indicated. The opulent may obtain a measure of relief from winter visits to milder climes, the poor man may still find some comfort in his bottle of medicine. For the adventurous there is an iron chamber in the cellars of Brompton Hospital. The bronchitic and emphysematous can surely dispense with the services of a surgeon.

DR. KINLOCH'S APPOINTMENT.

ON the first day of the New Year the Department of Health for Scotland will take over the powers and duties of the Scottish Board of Health, and its chief medical officer will have powers and duties similar to those of the chief medical officer of the Ministry of Health. Dr. John Parlane Kinloch, who has been appointed by the Secretary of State to hold this position, is a West of Scotland man, who graduated at Glasgow in 1909 and in 1923 succeeded Prof. Matthew Hay as medical officer of health to the city of Aberdeen, and head of the public health department in the University. The output of this department has been very striking, and Dr. Kinloch has shown his capacity to inspire a team of workers in the public health service to produce a remarkable series of valuable contributions to practical problems affecting the health of the community. His great achievement as an administrator has been the unification of the public health and poor-law hospital services of Aberdeen by agreement with the authorities, a change which is entirely on the lines of the hospital developments contemplated in Scotland as the result of the new reforms in local government. The special value of Dr. Kinloch's work has been in concentrating the full force of the official institutions on clinical medicine of every kind. This is the distinctively original note in his work. Incidentally, he has demonstrated the possibilities of cooperation among the public health, poor-law, school health, and local-control worker of the city, and of these authorities with the county authorities and with the general practitioners of the northern region. Dr. Kinloch is only 43. He comes to the new department with highly specialised training for the problems [illegible] Under the new regime he will be [illegible] to the [illegible] in every [illegible] of public [illegible]

[illegible]

Annotations.

"Ne quid nimis."

BOOKS AS FOMITES.

A REPORT [1] of the Consultative Committee to the Board of Education briefly reopens a subject dealt with in our columns three years ago,[2] the conveyance of infection through books. Dr. J. E. McCartney then concluded that—with the exception of small-pox—books from public libraries were not to be regarded as dangerous sources of infectious disease. His reasoning was based on the well-known delicacy of most of the organisms conveyed by droplet infection and on the absence of any record of cases infected through the agency of books. The streptococcus is known to survive drying for a short time only, and the unknown viruses of chicken-pox, rubella, and measles are also known to have little viability outside the body. The diphtheria bacillus has greater powers of survival; the membrane kept in the dark was found to contain living organisms several months later, but even this did not convince Dr. McCartney that it would live under the usual conditions in which books are kept. Small-pox, he felt, was in rather a different category. The disease in its severe form is so virulent and serious that no risks can safely be run, and it would be wiser to regard all books and papers as potential dangers if they have been handled by a small-pox patient. The conclusions reached by the advisers of the Board of Education do not differ from those of Dr. McCartney. The pathological laboratory of the Ministry of Health, several county and urban school medical officers, and three medical officers of large public schools contributed evidence, and advised that the risk of conveyance of infection was negligible. A book, they said, could only become infected if actually used by an infected child, and then would be dangerous only for a very short time. Attention had far better be concentrated on articles liable to gross infection, such as towels, handkerchiefs, sucked brushes, and chewed pencils. In the schools of the London County Council books are not disinfected as a routine, although library books from infected homes are usually disinfected by the medical officer of health before return to the school library. There has been much recent evidence and argument to show that room-disinfection, as usually carried out, is entirely futile and, indeed, the report mentions that sterilisation of books by formalin vapour has no value unless every page is closely exposed. Most of the witnesses preferred dry heat, which is liable to warp bindings a little but otherwise does not seriously injure the volumes. The general question is important because if books are, or can be, carriers of virulent organisms they must be responsible for an enormous amount of disease. Often the first thing a sick person demands is an extra supply of books from the library, and few households dream of feeling any responsibility for the infectiveness of the books on return. They may be back in the library less than an hour before they are handed out to some other subscriber who is highly susceptible to the organism in question. It would, however, be difficult to get direct evidence of actual cases of infection arising in this way. So far the evidence is more theoretical than practical, although there is no doubt that most authorities would agree with Dr. J. A. Brincker, principal assistant medical officer in the Public Health Department of the L.C.C., that "dosage, virulence, and susceptibility of the individual are of such great importance in the process of infecting the individual and spreading disease that the importance of spread from school-books recedes almost into insignificance as compared with the more common and important sources of spread."

[1] Books in Public Schools. H.M. Stationery Office. 1928. 1s. 3d.
[2] THE LANCET, 1925, ii., 212.

GLUCOSE IN NORMAL URINE.

THE belief that glucose is a constituent of normal urine, although usually considered heretical, has been expressed from time to time by serious observers, including Pavy. For over thirty years it has been a debatable point. Recently an Egyptian worker, Ali Hassan,[1] has examined in the Faculty of Medicine at Cairo the urine of some 700 Egyptians, mostly students, from 17 to 27 years of age, and has found glucose, in small amounts, in conditions which do not point to abnormal carbohydrate metabolism. He discusses the various tests employed and points out the unsatisfactory character of the yeast fermentation test as usually carried out, especially when the quantity of glucose is very small. The phenylhydrazine test, in which the characteristic osazone is formed, needs care when applied to urine as the crystals are frequently entangled with oily substances which render characterisation difficult. The technique followed by Hassan is as follows:—

25 c.cm. of urine were well mixed with 2 g. of charcoal (Merck's decolorising charcoal was used as a rule) and filtered after standing for 5 minutes. About 15–17 c.cm. of clear colourless filtrate was usually obtained, and to this was added 1 g. of a freshly made mixture of pure phenylhydrazine hydrochloride and sodium acetate (1 phenylhydrazine, 2 acetate, well mixed). The filtrate was placed in a boiling water-bath for 5 minutes, or just until the reagents were dissolved, and then filtered into another tube. The final filtrate was put back into the water-bath for 2 hours; it was then allowed to cool gradually in the bath, and the deposit was examined for crystals after 12–15 hours.

The reaction carried out as above is, the author says, not only sensitive but seldom fails to yield clear and well crystallised osazones, although sometimes yellow oily drops, which can be removed by washing with ether, may separate with the crystals. Normal urine gives mixed crystals of osazones, which Hassan states can be resolved into one identical with glucosazone and another which appears to be the same as Baisch's iso-maltosazone. As we have said, the urine of 700 people was examined, and 20–30 per cent. of the specimens voided 1–2 hours after an ordinary meal yielded typical glucosazone, the percentages being reduced to 12–15 and 7 with specimens voided respectively 4–5 hours and 12 hours after a meal. Experiments on the tolerance to 50 g. of glucose by 28 students showed that this was not necessarily due to abnormal carbohydrate metabolism. The old view that glucose in small quantities is a constituent of normal urine is thus in this investigator's opinion confirmed.

NATIONAL ASSOCIATION FOR COMBATING RHEUMATISM.

WHEN there are already many bodies engaged in the fight with some great national scourge, it is essential that any new organisation should have sufficient prestige and authority to be able to link up the work of the older foundations and to advise them in their activities. It is this need of a central body that led the former British Committee on Rheumatism of the International Society of Medical Hydrology, having dissociated itself from the Society, to propose the formation of a national association to deal with the problem of rheumatism in this country. Similar committees have already been formed in France, Germany, and other countries. A meeting to discuss this proposal was held at the Royal Society of Medicine on Nov. 7th. Sir Thomas Horder, having been elected to the chair, explained the position and emphasised the absolute necessity of constituting a really national body, representing all interests and of high status. He considered that the rheumatic problem in this country had great need of a central body to link up and

[1] Biochem. Jour., 1928, xxii., 1332.

strengthen existing efforts such as the Red Cross Clinic, the British Medical Association committee and the work carried on at the spas, as well as the activities of the Ministry of Health, which were described to the meeting by Dr. J. A. Glover. Already we have in London 230 beds allocated by the public authority for rheumatism and chorea, and 350 more are to be provided. The three rheumatism centres of the London County Council and the rheumatism clinics of Paddington and Kensington boroughs are doing excellent work, and indeed for acute rheumatism the public authorities are doing far more than they are for that bugbear of all concerned, chronic rheumatism. Nevertheless, the valuable reports of the Ministry of Health Office Committee and of the Medical Research Council have served to draw attention to the serious medical and economic problem. As Dr. Fortescue Fox observed, no group of diseases, save perhaps the tropical, is so disastrous to the public health and prosperity.

The meeting unanimously approved of the motion of Mr. W. A. Appleton (General Federation of Trades Unions) and Dr. C. W. Buckley, that a National Association should be constituted. After a little discussion of detail it was decided that the Association should have a Council representing all the various interests concerned and an executive committee of 12. The nucleus of this committee was elected at the meeting, the Chairman, Dr. Fortescue Fox, Dr. Kerr Pringle, Dr. Buckley, and Mr. Appleton being appointed, with power to coöpt. Dr. M. B. Ray will act as secretary pro tem. There are to be a number of standing committees, including the following: General purposes, Medical, Finance, Industrial, Approved societies, Administrative, Research. Dr. Morley Fletcher proposed, and Mr. H. Lesser seconded, that membership of the Association be open to all on payment of an annual subscription, and that members be entitled to attend and take part in an annual conference as well as other general or extraordinary meetings and to receive any publications issued by or on behalf of the Association. On the motion of Mr. P. Rockliff and Dr. W. Edgecombe, it was agreed to hold an annual conference for papers and discussions, the proceedings to be printed and circulated to all members.

"ENDOGENOUS" CYANOSIS.

ONE by one the abnormal conditions of urine formerly classed as "endogenous" or "essential" are being removed from that group as their ætiology is discovered. An interesting example is reported in Guy's Hospital Reports, July, 1928 (p. 275), by Dr. M. O. Raven, whose patient, a middle-aged lady who had suffered from many diseases and undergone many operations, was found suffering from pyrexia, hæmaturia, and marked cyanosis. On spectroscopic examination the blood showed the bands of methæmoglobin. This discovery was followed by a very full examination of the patient by Dr. A. F. Hurst; the conclusion was reached that the patient was suffering from a colonic infection. A cæcostomy was performed and the patient thereafter irrigated the lower bowel through the opening with 20 pints of water daily for some weeks, during which she improved not at all and continued to live in a pitiable state of ill-health. Not long after, when the patient had returned home, she was accidentally found to be taking very large quantities of antikamnia, a preparation that contains 70 per cent. of acetanilide. As soon as this habit of drug-taking was stopped the cyanosis disappeared not to return, though the kidneys had evidently been permanently damaged by the passage of abnormal blood-pigments over a long period of time. Dr. Raven remarks that during the war individuals anxious to escape military service were sometimes found by examining boards to be taking overdoses of phenacetin. Dr. J. A. Ryle adds a note to Dr. Raven's communication, stating that for some time he has been becoming increasingly suspicious that cases of so-called endogenous cyanosis are in reality due to drug-addiction, most of the patients with this rare complaint known to him having had peculiar psychological characteristics. Dr. Raven's case confirms this view and he points out that before declaring any case of methæmoglobinæmia with cyanosis to be of endogenous origin, it is necessary to exclude the taking of drugs of the acetanilide group. Indeed, he goes further and is inclined to doubt the existence of enterogenous cyanosis altogether. Cases of methæmoglobinæmia are so rare that it is unlikely that any single observer could decide the question; cases of microbic cyanosis have been described in some detail, but in the absence of any suspicion of the connexion no rigid exclusion of drug-addiction has been made. A well-organised collection of cases of endogenous cyanosis throughout the country and an impartial inquiry into their history and clinical condition would be required before a decision could be arrived at. In the meantime it must be remembered that other drugs besides those of the acetanilide group, especially potassium chlorate, carbon monoxide, sulphuretted hydrogen, sulphonal, and trional are capable of causing a chronic cyanosis. On the other hand, such rare diseases as Winckle's disease (epidemic hæmoglobinuria in the new-born), in which methæmoglobinæmia undoubtedly occurs, render it quite possible that corresponding changes in blood-pigment may occur in the adult as a result of infection.

ACCOMMODATION FOR THE SICK IN PUBLIC SCHOOLS.

A MEMORANDUM[1] on the accommodation for the sick in public schools has been published by the Ministry of Health, based upon an inquiry conducted at a considerable number of well-known public schools in England. The memorandum puts forward various recommendations which Sir George Newman hopes may be of some practical use to the governing bodies of the schools, to the masters and parents, and to school medical officers. The provision for the sick was found adequate as a rule to deal with ordinary trivial illness and mild infectious diseases in some schools, and with almost any sickness except large epidemics of infectious disease in others. The different types of accommodation provided included (*a*) house sick-rooms, (*b*) a sick-house, (*c*) an infirmary, (*d*) a sanatorium. The house sick-rooms were usually utilised for minor illnesses, but in some schools this accommodation had to deal with all cases of sickness other than infectious or major surgical cases. The house sick-rooms were usually near the quarters of the house matrons, and were of greatest use in those schools where the medical officer gave only part time to this work; in those schools where the medical officer was on a whole-time basis, the boys were usually transferred, when sick, to the sick-house, infirmary, or sanatorium. Great differences were found between the sick accommodation of various kinds provided at different schools; many schools having ample, others negligible, accommodation. The sick-house was, as a rule, a building intended for the reception of all non-infectious cases and often replaced house sick-rooms. An out-patient department and sometimes an operating theatre and an X ray room were occasionally included in the sick-house, which house was usually centrally situated. The infirmary was found to be a building intended for the accommodation of all kinds of sickness, whether medical, surgical, infectious, or non-infectious, including an out-patient department, all under the care of a medical officer. It was usually situated away from the school buildings. As regards emergency accommodation for epidemics of infectious disease, it was found that in some schools no prearranged plan existed for dealing with such an emergency, while in others, dormitories and large class-rooms could be quickly converted into

[1] A Memorandum on the Accommodation for the Sick provided at certain Public Schools for Boys in England. By Capt. W. Dalrymple-Champneys, M.B.E., Ministry of Health. London: H.M. Stationery Office. Pp. 35. 1s.

wards, and some class-rooms were even specially planned so as to be used for this purpose if necessary. It was found that in many schools no adequate facilities existed for the proper isolation of doubtful cases of infectious disease, such as separate sanitary arrangements in the sanatorium. Quite modern buildings often contained a quite inadequate number of sanitary conveniences.

The second part deals with the principles which should guide schools in providing new accommodation or extending that which already exists, and the minimum standards to which such provisions should attain. The memorandum makes the following suggestions as to the proportion of sick-beds to boy population: (*a*) The total number of sick-beds—including those in house sick-rooms, sick-house, infirmary, and sanatorium—should not, as a rule, be less than 18 per cent. of the total boy accommodation; (*b*) house sick-rooms are regarded as essential except for schools which are so centralised that arrangements can be made for immediate removal of boys to infirmary, sick-house, or sanatorium at any hour of the day or night. The minimum ration of beds in house sick-rooms should be 6 per cent. of the boys in the school; (*c*) the total number of beds outside the school-houses, in the infirmary or sanatorium, should be 12 per cent.; (*d*) the number of beds for non-infectious patients, excluding those provided in separate school-houses, should be 2·5 per cent. of the population; (*e*) infectious beds to cope with small epidemics should be provided, the suggested proportion being 9·5 per cent. of the population.

The memorandum goes on to consider many other important points, such as the position and site and disposition of the buildings, and the actual accommodation for the patients. The types of wards needed for infectious and non-infectious cases are also discussed. Bed space, sufficient for non-infectious cases, can be adapted to infectious cases if necessary, either by spacing out the beds or by leaving an empty bed between every two patients. The provision of suitable dayrooms for convalescent boys in the hospital block is advised and also sanitary annexes, duty rooms for the nursing staff, and adequate suitable accommodation for the nursing and domestic staff. In the last section of the memorandum the construction of the hospital or sanatorium is considered in detail, and useful suggestions are made as regards heating, lighting, and sanitary arrangements. It is a little remarkable that no mention is made of the use of any available accommodation in neighbouring isolation hospitals; nor is there any pronouncement as to preventive measures which might in the future affect the number of beds required for infectious cases such as diphtheria and scarlet fever. No doubt the time will come when many more diseases will be wiped out by preventive and sanitary measures. Even now, such diseases as diphtheria, scarlet fever, small-pox, and to a great extent also enteric fever, could be prevented. Apart from specific measures, it might be emphasised that if boys are taught to live in the open air by day and to sleep as nearly as possible in the open air by night, there is far less chance of infection by microbic diseases.

INJURY AND INFECTION.

It has long been recognised that local injury of tissues often determines the site at which microbes circulating in the blood stream settle down and produce their characteristic lesions. The clinical connexion between injury of bones and acute osteomyelitis or tuberculosis is well known; experimentally *Bacillus welchii* and the tubercle bacillus may be localised by injections of calcium salts or silica. The skin lesions of many non-bacterial diseases (syphilis, small-pox, vaccinia, foot-and-mouth disease, chicken-pox, and measles) are influenced by trauma or irritation in the same way; so is the active agent of the Rous sarcoma. Sir Thomas Lewis and his co-workers have lately shown that all forms of injury of the skin lead to the local liberation of histamine (or near-histamine), which causes a local vaso-dilatation and an increase in capillary permeability, and the same thing probably happens in all tissues. It has occurred to Dr. G. M. Findlay[1] that these facts may afford an explanation of the relation between infection and injury, and in a series of elegant experiments he makes out a good case for his suggestion. A rabbit was injected intravenously with a culture of *Staphylococcus aureus* and then 0·02 c.cm. of histamine solution was injected intradermally into the right flank and 0·02 c.cm. of phosphate buffer solution into the skin of the left flank; these injections were repeated hourly for three hours. Twenty-four hours later the area which had received histamine was inflamed, and during the following days the lesion developed into abscess formation with sloughing of the skin; abundant staphylococci were found microscopically and recovered in culture. The site of the control injections showed no obvious change and nothing more than a transient excess of leucocytes could be found histologically. Experiments along these lines were also made with *Streptococcus hæmolyticus*, a pneumococcus, and the viruses of fowl-pox, vaccinia, and the Rous sarcoma, and in each case histamine was effective in localising a generalised infection. Whether the vascular dilatation or the increased stickiness and permeability of the capillary wall is the more important factor in producing this result is uncertain. Perhaps both are effective.

AN EMERGENCY OF CHILDHOOD.

Under the name of acute laryngo-tracheobronchitis Dr. H. L. Baum, of Denver, describes[2] a severe form of acute inflammation of the upper air passages, in which the symptoms are such as to require the introduction of a tube to prevent asphyxiation. The condition, though rare, is, of course, not unknown, being usually classified under the heading of œdematous laryngitis; but Dr. Baum has rendered good service in calling attention to its characteristics, for it is a very serious affection and one in which prompt recognition and treatment may save a life. The disease occurs almost exclusively in children; of Dr. Baum's 24 cases the oldest was 9 years, and 15 were under 3 years of age. It usually develops in the course of an acute infection of the respiratory tract, the onset being that of an acute cold with rhinitis and pharyngitis, and it is most common during the seasonal epidemics. The signs are embarrassment of respiration, retraction in the epigastric, suprasternal, and supraclavicular regions, and cyanosis. The respiratory obstruction is due to subglottic œdema, and Dr. Baum makes the important point that there is seldom any marked swelling of the larynx above the glottis. He also lays stress on a fact of great importance, not only in this affection, but in all forms of obstruction of the upper air passages in young children—namely, that from this obstruction they are subjected to the most severe physical strain imaginable, which throws a terrific burden on the heart. The result is that the cyanosis is of a characteristic pale character, and that the patient is not so much blue as white. In this condition, therefore, as in all forms of laryngeal obstruction, the urgent indication is to restore the airway without delay. A comparatively low temperature is characteristic of this exhaustion from dyspnœa, and it frequently rises to 104° or even 105° F. after tracheotomy has been performed. In his earlier cases Dr. Baum always performed tracheotomy, but he found that plugs of inspissated mucus subsequently formed in a number of cases and blocked the trachea and large bronchi; they were often removed with success through the bronchoscope, but his experience is that they are less liable to occur after intubation, which he now prefers in the treatment of these cases. Steam did not appear to prevent the formation of the plugs. Even after relief of the respiratory obstruction, the prognosis is still extremely grave, for the infection is

[1] Jour. Path. Bact., 1928, xxxi., 633.
[2] Jour. Amer. Med. Assoc., Oct. 13th, 1097.

a virulent one, and pneumonia often develops. This may be either lobar or broncho-pneumonic in type and it is the commonest cause of death, accounting for nine of the ten deaths in Dr. Baum's series of 24 cases.

A PATHOLOGICAL LABORATORY FOR THE CUMBERLAND INFIRMARY.

AFTER prolonged negotiations a proposal to build and equip a pathological department at the Cumberland Infirmary, Carlisle, was adopted at a special meeting of the committee of management held on Nov. 5th, and the subcommittee which had drafted the proposal was reappointed to carry it into effect. The report which led to this welcome decision indicated how the work of a hospital with 379 beds was being hindered by the want of such a department. Examples were given of the function of such a laboratory in the diagnosis of diphtheria by laboratory methods, in the determination of the type of organism in (say) cerebro-spinal fever, without which the appropriate serum could not be determined and administered, in reducing the risks of operation on the eye by preliminary bacteriological investigation, in the preparation of vaccines from the organism actually causing the disease, and in the diagnosis of new growths by personal collaboration between clinician and pathologist. The proposal includes the engagement of a fully qualified whole-time pathologist, with a qualified technical assistant and a laboratory boy to assist him, the work to be classified under the three headings of bacteriological, histological, and biochemical. The sum of £3000 is suggested as the cost of the building with its initial equipment, and considerable return of revenue is anticipated from the fees in respect of outside work from public authorities. The capital cost of the building being already provided for by funds in hand or promised for the purpose, only the annual cost, estimated at £800 per annum during the first few years, will fall on the hospital budget. The work is to be put in hand at the earliest possible date, with a view to having the department in full operation at the official opening of the new hospital wards. The hope is expressed that in the course of time the Cumberland Infirmary will become a recognised centre of clinical research.

AN INTENSIVE CANCER CAMPAIGN.

A CAMPAIGN against cancer, organised jointly last April by the Committee on Cancer of the Massachusetts Medical Society, the Massachusetts Branch of the American Society for the Control of Cancer, and the State Department of Public Health, has provided instructive material for students and critics of educational health movements. According to the report of Dr. F. G. Balch, Dr. G. H. Bigelow, and Dr. R. B. Greenough,[1] the plans for this campaign included a mass meeting in each city in which there was a State-aided cancer clinic, a request to each of the 18 district medical societies to hold a special meeting to consider cancer control, an information bureau, and press, poster, cinema, and wireless publicity. A letter was addressed to the clergy, asking for a pulpit announcement of the campaign on Sunday, April 22nd. Fifty-seven speakers, primed with facts and theories about cancer, addressed 129 groups, or an approximate total of about 12,000 persons. Among the speakers were the Governor and Mayor of Boston. To elicit expert opinions on the results of this campaign, a questionaire was sent to all the physicians in Massachusetts asking for: (1) the number of people with cancer who sought advice during May as a result of it; (2) the number without cancer but with some definite disease who sought advice under the same conditions; (3) the number without cancer or other disease who sought advice; and (4) the opinion of the physicians of the value of such campaigns. About 25 per cent. (1179) of the Massachusetts physicians responded. They had examined 3086 persons as a result of the campaign, and had found 438, or 14 per cent., to be suffering from cancer. These figures did not include the persons who attended cancer clinics. An opinion as to the value of the campaign was expressed by 1132 physicians, of whom 26 considered the campaign as of no value, 38 as harmful, whilst 108 were doubtful. The remaining 960, or 84·7 per cent. thought it was worth while. The number of cases of cancer seen in the clinics rose during the campaign, and fell rapidly afterwards. The percentage of operable cases was not, however, altered appreciably—a fact which suggests that cancerphobia was not markedly increased. Besides the 438 persons with cancer, there were 1427 who sought advice as a result of the campaign, and who were found to be suffering from some disease other than cancer. For every person visiting a cancer clinic, there were approximately 22 who consulted practitioners privately.

[1] New England Jour. Med., August 30th, 1928.

THE SECRETIONS OF THE OVARY AND OF THE PITUITARY BODY.

NOTHING is more encouraging in modern medicine than the speed with which new discoveries are being made available for trial at the bedside. It is happily in the interests of the manufacturing chemists to pounce quickly on any line of inquiry that may enable them to market an effective drug or prepare a potent extract in advance of their fellows, and the competition between them has resulted in the establishment of many research laboratories whose commercial origin serves only to lend a practical bias to the work carried on and not at all to affect its high quality. It was from the laboratories of Parke, Davis and Co., for example, that Oliver Kamm and four colleagues described early in this year[1] the separation of two extracts in the posterior lobe of the pituitary body, the one having oxytocic power (the power to stimulate the musculature of the uterus), and the other having the pressor property. Working at the Wellcome Physiological Research Laboratory at Beckenham, J. H. Gaddum[2] has confirmed the work, which was considered in April last by the Permanent Commission of the Health Organisation of the League of Nations which deals with the standardisation of sera, serological reactions, and biological products. Fortunately for convenience in standardisation, the oxytocic and pressor activities seem to vary together in any batch of material. For the purposes of biological assay the test on the isolated uterus of the virgin guinea-pig, described in the United States Pharmacopœia, Edition X., is recommended by the Commission for estimation of the oxytocic activity, while for estimation of the pressor activity comparative tests on the anæsthetised dog or the decapitated cat are recommended; in practice the discoverers of the method of separating the two principles have found no difficulty in expressing the activity of their univalent preparations in pressor and oxytocic units of 0·5 mg. of the international standard powder. It remains to be considered whether the antidiuretic action of pituitary extract is not yet due to a third principle, whose activity may or may not be expressible in antidiuretic units of the standard powder.

The clinical importance of the separation of these principles is emphasised in THE LANCET of Oct. 6th, 1928 (p. 691), by Mr. Aleck Bourne and Dr. J. H. Burn. They confirmed by direct observation on the human subject that fact that the pituitary principle which acts on the parturient uterus is identical with that which Kamm and his co-workers found to stimulate the non-pregnant guinea-pig uterus, and they also noted that vasopressin, even in large doses, has little if any effect on the uterus in labour. In fact, they found no difference between the action of oxytocin and that of pituitary extract on the uterus, and point out that the use of the former has the

[1] Jour. Amer. Chem. Soc., 1928, l., 572.
[2] Jour. Phys., 1928, lxv., 131.

advantage of precluding the possibility of pituitary shock, for it is to the vasomotor effects of the extract that collapse (rarely but serious when it occurs) has been attributed. On another page of this issue of THE LANCET Mr. Bourne and Dr. Burn record some further observations, this time on animals, which suggest that the mode of action of pituitary extract on the parturient uterus may be even more complicated than has been supposed, and may depend partly at least on the synergistic action of œstrin. The isolated uterus of a guinea-pig was put in a bath of 100 c.cm. of Ringer's solution and treated with sufficient pituitary extract to produce a small contraction. The solution was then changed, to remove the pituitary extract, and a dose of 0·05 units of œstrin was added to the bath and allowed to remain for 6 minutes. At the end of this time the same dose of pituitary extract (0·01 units) was added but now the contraction was very much greater than that previously recorded. Later the solution was again changed and after complete relaxation had been established it was observed that the addition of pituitary extract alone produced only the very small contraction first recorded. In order to test the specificity of effect a corresponding experiment was carried out using histamine instead of pituitary extract, with negative results. The fact that this relationship between œstrin and pituitary extract is specific suggests to the authors that the phenomenon is one of physiological importance, though they admit that only clinical investigation can decide to what extent the sensitiveness of the uterus to pituitary extract can be enhanced by the use of œstrin.

It would be tempting, but probably at this stage quite unjustifiable, to attempt to correlate this work with that on the new tests for pregnancy which we surveyed recently.[3] The urine of pregnant women near term contains a large quantity of œstrin, as does also the placenta. According to B. Zondek and S. Aschheim the ovarian hormone is accompanied by the hormone from the *anterior* part of the pituitary gland, which latter they regard as the activating factor. It is evident that the interaction of the secretions from the ductless glands are exceedingly complex and it seems possible that the functions of the two parts of the pituitary may after all have something in common.

THE poll for elected members of the Dental Board established under the provisions of the Dentists Act, 1928, of the Irish Free State, was held last week. Of dentists registered otherwise than under Section 3 of the Dentists Act, 1921, the following were elected: Messrs. J. E. Hogan, K. McGrath, J. I. Potter, and K. E. O'Duffy. Of dentists registered under Section 3 of the Dentists Act, 1921, the following were elected: Messrs. A. J. McGinty and G. C. Johnston. The Board is now complete.

THE Royal Dental Hospital is to be congratulated on having decided to establish a department of electrotherapeutics for the treatment of dental disease, to which Mr. F. Talbot, who has devoted much attention to the application of ultra-violet radiation to dental conditions, has been appointed. This is a wise step, for while there seems little doubt that electrotherapy and ultra-violet rays may be usefully employed in dental disease there is still much to be learned about the scope and limitations of these newer forms of treatment, and the establishment of such a department as part of a dental hospital offers an opportunity for careful clinical investigation.

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[3] THE LANCET, Oct. 20th, p. 834, and Oct. 27th, p. 876.

WIMBLEDON HOSPITAL.—Prince and Princess Arthur of Connaught will visit this hospital on Wednesday, Nov. 21st, at 3 P.M., when Princess Arthur will open the new children's wing.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XI.—THE ARNETH OR POLYNUCLEAR COUNT.

BY W. E. COOKE, M.D. LIVERP., M.R.C.P. LOND.,
PATHOLOGIST AND BACTERIOLOGIST, WIGAN INFIRMARY.

IN the Arneth or polynuclear count the polymorphs are separated into five classes according to the number of their nuclear segments. Cells with undivided nuclei are placed in Class 1, those with two lobes in Class 2, and so on to Class 5. Polymorphs with more than five nuclear segments are so rare in normal blood that when they do occur they are placed in Class 5.

The Count in Health.

The length of life of the polymorph in the blood stream is about three weeks. It enters the circulation from the marrow as a Class 1 cell with a single lobed nucleus, and as the cell grows older the nucleus becomes more segmented. The average normal count, that is, the percentage in the various classes, is:—

(1)	(2)	(3)	(4)	(5)
10	25	47	16	2

This is subject to slight individual variations, but a count with more than 40 in Classes 1 and 2, the left-hand columns, should be considered abnormal. These figures represent a polymorph population comparable to infants, children, men, old men, and senile men, in which the deaths in the older groups are exactly compensated for by the births from the marrow. The figures of the polynuclear count tell us whenever this normal state becomes altered, whether by the addition of an unusually large number of young cells, by the removal of an unusually large number of old cells, by both these conditions combined, or by some interference with the normal development.

The Count in Disease.

In all cases of microbic infection there is an increase in the percentage of the younger cells of Classes 1 and 2, and a diminution in Classes 3, 4, and 5, and the count has, in Arneth's words, a left-handed drift. This is true, whether the total polymorphs remain normal in numbers, whether there is a polymorphic leucocytosis, or whether there is a polymorphic leucopenia. This last condition—increased activity of the marrow with diminution of the total number of polymorphs in the circulation—appears paradoxical, but obtains in all infections where there is a leucopenia. Any increase in the cells of Classes 1 and 2 above 40 indicates toxæmia. The amount of the deflection depends upon the severity of the toxæmia and the amount of consequent marrow reaction. The count, therefore, should be deflected less in cases with a small local infection such as early laryngeal tuberculosis, dental sepsis, and duodenal ulcer, than with a general infection such as pneumonia, or where the absorptive area is large as in advanced pulmonary tuberculosis. This is, in fact, found in practice.

The Count in Diagnosis.

Bearing the above facts in mind, it will be apparent that the count, by the confirmation of the presence or the absence of infection, can be of great assistance in diagnosis. This is exemplified in the following case:—

W. H., aged 24 years, gave the history of having had "sciatica" in both legs three months previously. This was relieved by aspirin but left his legs somewhat weak after walking. Otherwise, he said he was quite well and thought of resuming work. Clinical examination revealed nothing, except that the left knee-jerk was difficult to

elicit. The eleventh thoracic spine was somewhat more prominent than normal but there was no tenderness on percussion nor on hyperextension of the spine.

A blood film was taken as a matter of routine and showed the following:—

Differential count (per cent.): polymorphs, 44; lymphocytes, 40; monocytes, 13; eosinophils, 2; plasma cells, 1.

Polynuclear count:—

(1)	(2)	(3)	(4)	(5)
42	40	18	0	0

The fact that the polynuclear count showed a marked left-handed deflection indicated that there was a source of infection of considerable activity and led to further investigation at once. X ray examination revealed tuberculous disease of the body of the eleventh thoracic vertebra.

The following is an example of infection suspected but proved not to be present:—

B. L., aged 12½ years, complained of pain and tenderness in the right iliac fossa simulating appendicitis. The polynuclear count was:—

(1)	(2)	(3)	(4)	(5)
11	31	43	14	1

This excluded any possibility of acute appendicitis.

That these cases are not exceptional, anyone using the count as part of routine clinical examinations can testify.

The Count in Prognosis.

The length of life of the polymorph being 21 days, it is obvious that once the polynuclear count has become deflected by an infection, the minimum time for its return to normal will be three weeks. In diseases as diphtheria in which the toxin can be neutralised at once, the count occasionally returns in that time to normal, but in most infections the return is gradual and may take 6 to 12 weeks or longer. If the patient is recovering the count will show a lessened left-handed drift on repeated examinations, but if any complication arises, there will be a check in the right-handed movement and a further increase in Classes 1 and 2.

N. C. had an infection of the patellar bursa, lymphangitis, and lymphadenitis of the glands in Scarpa's triangle. The bursa was opened on Oct. 13th, 1926. Her counts were as follows:—

Date.	(1)	(2)	(3)	(4)	(5)
Oct. 13th, 1926	46	32	21	1	0
„ 21st, „	33	41	25	1	0
Nov. 3rd, „	18	42	32	8	0

Nov. 4th: Rigor, temperature of 100° F., acute tonsillitis.

Nov. 5th, 1926	55	30	15	0	0
„ 12th, „	40	46	12	2	0
„ 19th, „	22	42	32	4	0
Dec. 3rd, „	12	38	38	12	0
Jan. 5th, 1927	10	22	46	18	4

As a guide to the effect of treatment, for instance, the removal of a focus of infection, the following example may be quoted. The first count was taken before an operation for removal of infected tonsils and adenoids, which took place on the same day.

Date.	(1)	(2)	(3)	(4)	(5)
Jan. 23rd, 1924	25	36	36	3	0
Mar. 14th, „	8	28	41	18	2

The Count in Addison's Anæmia.

As mentioned above, polymorphs with more than five nuclear segments are rare in normal blood. In Addison's anæmia polymorphs with hypersegmented nuclei are frequent, and in many of these cases the count is actually right-handed. Large numbers of cells showing six, seven, or as many as ten nuclear segments are present. These are placed in Class 5. Typical counts are as follows:—

(1)	(2)	(3)	(4)	(5)
8	29	29	22	11
7	16	29	30	9
16	29	32	16	14
10	15	38	24	13
6	20	42	20	12

Occasionally, a count in pernicious anæmia shows the curious state of being left-handed, but at the same time having a large percentage of polymorphs with five or more segments as in the following:—

(1)	(2)	(3)	(4)	(5)
20	31	17	16	16

The explanation of this is obscure, but one may conclude that in this disease there is some interference with the normal development, either by inherited defect from its marrow parent, or by the presence of some substance in the plasma that prematurely ages the polymorph, or by dysfunction of the physiological mechanism which is responsible for the destruction and elimination of aged leucocytes.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdrs. J. E. Johnston and R. Willan are placed on the Retd. List with the rank of Surg. Capt.

Surg. Lt.-Comdr. F. H. Vey to be Surg. Comdr.

Surg. Lts. H. J. McCann to *Montrose*, and D. L. Pow to *Rosemary*, on commg.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt. C. C. Elliott to be Surg. Lt. Comdr.

ROYAL ARMY MEDICAL CORPS.

The undermentioned Capts. to be Majs.: F. G. L. Dawson, W. S. Martin, G. B. Hadden, C. M. Forster, C. F. Anthonisz, J. T. McConkey, F. R. H. Mollan, G. O. F. Alley, W. H. A. D. Sutton, A. R. Oram, G. T. Gimlette, C. H. C. Byrne, T. E. B. Beatty, C. O. J. Young, J. Bennet, J. C. Preston, and J. V. McNally.

P. D. Johnson to be Temp. Lt.

D. C. McC. Ettles to be Lt. on prob.

TERRITORIAL ARMY.

J. V. Morris to be Lt.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Capt. J. L. Johnston from the Active List to be Capt.

INDIAN MEDICAL SERVICE.

Debi Prosad Mitra and Tulsi Das to be Temp. Lts.

T./Lt. Sangham Lal relinquishes his temp. commn.

COLONIAL MEDICAL SERVICES.

The following appointments have been made by the Secretary of State for the Colonies: Dr. D. B. Wilson, Dr. K. Edmundson, and Dr. F. V. Adams, Medical Officers, Tanganyika Territory; Dr. R. S. F. Hennesey and Dr. J. S. Brown, Medical Officers, Uganda; Dr. A. J. W. Wilkins, Medical Officer, Kenya; Dr. S. Batchelor, Medical Officer, and Miss W. D. Cargill, Lady Medical Officer, Gold Coast; Miss E. M. Turner, Medical Inspector of Schools, Federated Malay States; Dr. L. A. P. Slinger, District Medical Officer, St. Lucia; Dr. D. B. Smith, Medical Officer, Straits Settlements; Mr. J. I. Moir, Colonial Surgeon, Falkland Islands; Captain W. Foskett, Medical Officer, Fiji; and Mr. D. C. Bell, Medical Officer, West African Medical Staff (Colony not allocated).

DEATHS IN THE SERVICES.

The death was announced last week of Major-General John Blackburn Smith, C.B., C.I.E., I.M.S., retired, President of the Medical Board at the India Office and Medical Advisor to the Secretary of State for India. He was the son of the Rev. J. A. Smith, of Cork, and was born on Jan. 21st, 1865. He received his medical education at Queen's College, Cork, and graduated in medicine and surgery at the Royal University of Ireland in 1887. Two years later he obtained his first commission in the Indian Medical Service, and was in military employ till 1891, when he was appointed civil surgeon in the Bombay Presidency, and served at various stations there. He was A.D.M.S. of the Poona Division, D.D.M.S. of the Eastern Command in India, and was an hon. surgeon to the Viceroy. For his services during the European war he was mentioned in despatches, awarded the C.B. in 1918, when he became hon. physician to the King, and the C.I.E. in 1922. General Smith married, in 1899, Leta Mayne, daughter of the late W. R. Nelson, of Belfast, by whom he had three sons and one daughter.

Special Articles.

THE UNIVERSITY OF LONDON:

THE NEW STATUTES.

BY PERCY M. WALLACE, M.A. OXF.

I.*

To the issues of THE LANCET of September 24th and October 1st, 1927, I contributed two articles, in which I dealt respectively with the constitution and machinery provided for the University of London in 1900 by the Commissioners appointed by the Act of 1898, and with the administration by the new Senate of the organisation thus committed to their charge, including the developments which they had themselves initiated and carried out within the terms of the Statutes—occasionally amended, as need arose—under which they worked.

I have now to bring the story up to date by indicating the general character of the new Statutes which have recently been promulgated by another body of Commissioners appointed by a later Act of 1926. Before, however, proceeding to summarise this latest instrument, it appears due to all the parties, and to the situation generally, to refer briefly to successive steps taken in the interval between those dates—if only to show how intense and prolonged has been the effort made to supply London with a University adequate to her complex requirements. For within less than nine years of the reconstruction of which I gave an account in the first of my earlier articles some dissatisfaction—not so much with the actual operations of the Senate as with the conditions imposed on those operations—had begun to demand a radical revision of the new constitution.

To the general public, unable to appreciate the peculiar delicacies and complications involved, it may appear strange—it may even be regarded as in some degree a reflection on the earlier Commissioners or on the Senate (or on both bodies)—that machinery so laboriously constructed should within so short a space have been considered to require so extensive an overhaul. But this is not a complete or even an equitable statement of the case. To those who had been concerned with the daily administration of the new system the need for further reform was not evident—at any rate it did not appear urgent. Indeed, looking back, as we can now do, over nearly twenty years' further record, we may regard it as a remarkable tribute to the insight of the Commissioners of 1898 that out of the confusion and conflict of that date they should have proved themselves able to devise—almost *de novo* as far as their chief problem was concerned—a constitution which has in the main continued down to the present year to display an unfailing and fruitful vitality. The developments which the Senate, always alert and always cautious, have under the now moribund dispensation achieved, both in the scope of their operations and in the efficiency of their methods, have for the most part and in all essential respects been conducted along the lines laid down in the Statutes of 1900; and such amendments of this governing code as have from time to time been found technically necessary for the regularisation of their projects have in almost every case been amendments in the strict sense—not rescissions or fundamental alterations, but natural and organic expansions or adjustments which the original authors would certainly have gladly incorporated in their text had the conditions which called them forth been operative at that date.[1]

But, although the Commissioners of 1898 may, as we now recognise, be justly and frankly credited with having constructed better than they themselves could have known, and though the evolution of the re-organised University proceeded generally with a smoothness that only devotion and good will could have won from apparently so cumbrous a machine, it became gradually evident that in Government quarters there was a considerable degree of discontent with what was regarded as the slowness of the rate of practical progress. This opinion, I repeat, was not shared to any notable extent by those actually engaged upon the detailed administration of the organism, whether concerned specially with the Internal or the External interests or not affected by any strong party bias. The general view of the Senate was that they had accepted the new constitution, that they appreciated its various bearings and the difficulties involved in its practical operation, and that they could be trusted, if left alone, to carry out their duties fully and fairly for the benefit of all classes. But the higher authority prevailed, and on February 24th, 1909, a Royal Commission was appointed, with Mr. (the late Lord) Haldane as Chairman,

"to inquire into the working of the present organisation of the University of London, and into other facilities for advanced education (general, professional, and technical) existing in London for persons of either sex above secondary school age; to consider what provision should exist in the Metropolis for University teaching and research; to make recommendations as to the relations which should in consequence subsist between the University of London, its incorporated Colleges, the Imperial College of Science and Technology, the other Schools of the University, and the various public institutions and bodies concerned; and further to recommend as to any changes of constitution and organisation which appear desirable; regard being had to the facilities for education and research which the Metropolis should afford for specialist and advanced students in connection with the provision existing in other parts of the United Kingdom and of Our Dominions beyond the Seas."

This Commission, having in the course of the next four years issued an Interim Report and four bulky volumes of evidence taken from a vast number of witnesses, submitted their Final Report on March 27th, 1913. They commenced by emphasising their deliberate conviction that the University as then organised was "fundamentally defective," and proceeded to develop an almost entirely new constitution, of an even more complicated character than that which they desired to supplant. There was to be a new body, a "Court," of "about 200" members, in supreme control, with a Senate, of 15, as the executive; the Academic Council, of about 20 members, would be in the main confined to limited advisory functions; there would be a new "Committee for Technology," with wide executive and financial authority; to the Faculties would be entrusted very extensive powers and duties; and the status of Professors, Readers, and other Teachers respectively, and the position in the general system to be held by Colleges, Departments, and Schools, would be considerably (in some cases very greatly) affected either by enlargement or by diminution—these and numerous other provisions being set out at laborious length and in precise detail. Fortunately, we are not concerned with the *minutiae*—or even with the general outlines—of this prodigious scheme, which cannot be regarded as in any vital sense the basis of the Statutes just promulgated. For, though a Departmental Committee of the Board of Education was appointed five months later to consider what steps could best be taken to carry it into effect, the outbreak of the War in the following year put a stop to its labours, and the long period of efforts towards national recovery and reconstruction that followed the signature of Peace did nothing to encourage their revival. And when, on October 8th, 1924, the President of the Board appointed a new Departmental

* Part II. will appear in the next issue of THE LANCET.

[1] In confirmation of this view I may mention that on no occasion since 1900 has the Privy Council refused its assent to any amendment submitted by the Senate.

Committee, with Lord Ernle as Chairman, it was with a reference couched in significantly cautious terms:—

"To consider the Final Report of the Royal Commission on University Education in London dated the 27th March, 1913, and, having regard to present circumstances and after consultation with the persons and bodies concerned, to indicate what are the principal changes now most needed in the existing constitution of the University of London and on what basis a Statutory Commission should be set up to frame new Statutes for the University."[3]

This body, to the Chairmanship of which Mr. (now Sir) Hilton Young had been, in February, 1925, appointed on Lord Ernle's resignation through ill-health, issued their Report in March, 1926.[4] They prefixed to their constructive comments a declaration as follows:—

"A careful examination of the Haldane Report and the knowledge which we have acquired of the progress and development of the University, particularly since the war, have led us to the conclusion that it would now be impracticable to attempt to give effect to some of the major recommendations of the Commissioners. There are other recommendations which require modification to meet altered circumstances, and there are others, again, which the University has already substantially adopted."

Of the idealism of the Commissioners, and of their "careful and comprehensive analysis of constitutional problems," they spoke with admiration and gratitude. "But," they added,

"we conceive our terms of reference as conferring on us the duty of devising an immediately practicable scheme for the better government, organisation and development of the University to which effect may be given by way of a Statutory Commission, and we are convinced that with the lapse of time and material change of circumstances some of the main recommendations of the Haldane Report have lost their force, and that the ground for attempting to impose such an entirely new constitution on the University as the Report proposed no longer exists.

"A practicable scheme of reform and reorganisation must, in our opinion, be evolutionary rather than revolutionary and build as far as possible on existing foundations. With a characteristics peculiar to the University of London have been truly established, the University has developed greatly during the past twenty-five years, even though hampered by serious constitutional defects. For the remedy of these defects we are obliged to recommend some fundamental changes."

Having thus indicated the conservative interpretation which they had felt justified in placing upon their terms of reference, they set forth in less than fifty short pages the general outlines, not of an ideal scheme for inscription on a *tabula rasa*, but of the amendments to the existing constitution which they considered at once necessary and adequate; and it is upon this slight fifteen-penny pamphlet, clear-sighted and sympathetic, sufficiently reasoned in form and singularly attractive in style, that the Commissioners of 1926 have based their Statutes which are to come into force immediately upon their approval by His Majesty in Council.

Before considering these in detail I think I may profitably summarise and explain those paragraphs of the Departmental Committee's Report which set forth the principles that determine and dominate these proposed changes, the detail respectively with the part of the External Students, of the Internal Colleges and the Schools, of the Inter-[illegible] and the other student bodies, of financial [illegible].

No [illegible] of the University has [illegible] such intense and at times acrimonious controversy as the conferment of degrees upon all persons who pass the necessary examinations, in whatever locality and by whatever methods prepared for their successive tests. As I mentioned in my article which appeared in THE LANCET on September 24th, 1927, all degrees had since 1858 been so conferrable except in Medicine and Surgery. The arguments on each side need not be repeated here, but the Haldane Commission were strongly out of sympathy with the whole system, and, though they did not in so many words advocate its abandonment, they expressed with some vehemence their conviction that "there can be no doubt that in the broader national interests the sooner the demand for External degrees can be reduced to a point at which the degrees themselves can be abolished without hardship the better it will be for our schools and our teachers." At an early stage of their deliberations the Departmental Committee made public their unanimous opinion that External examinations "have in the past served, and will in the future serve, a useful purpose," and in their Report they bore testimony to the "growing sense of harmony in the University" which it would be gratuitous to disturb. They further declared that they did not propose to interfere with the system, inaugurated in 1900, by which the advisory administration of the External Department generally was placed in the hands of a Committee consisting mainly of the representatives on the Senate of the graduates in Convocation, which body had "in the past been regarded as the protector of the interests" of the External Student. Such a system was confessedly illogical (especially as the *personnel* of Convocation was from the nature of the case steadily losing its original predominantly External complexion), but in practice it did not work inconveniently; and in view of the friendlier relations then existing between the two sides they recommended its continuance—not only in consideration of its historical basis but also as a matter of general policy.—This matter of External degrees is, of course, of less interest to medical graduates and undergraduates than to those in any other Faculty; but I mention it here, not only because the general principle involved affects the organic structure of the University at large, but specially out of regard to that small and regularly decreasing number of candidates who have been and are being prepared for their examinations for London degrees at approved Schools of Medicine in the provinces and throughout the Empire.

(ii) The constitution of 1900 provided the University with a number of specially privileged "Schools" and a further number of diverse and heterogeneous Institutions as the administrative constituents of its Internal side. In 1907 University College was by an agreed Act "incorporated" in the University—that is, transferred bodily to the complete control of the Senate—and in 1910 King's College (excluding its Theological Department) followed suit, the immediate supervision of each being entrusted to a specially constituted Committee acting on the spot.[5] The Haldane Commission, recognising the difficulty of the situation thus developed from the point of view of the Schools which had not so surrendered their independence, were in favour of a comprehensive and complete extension of the policy of incorporation, which had indisputably led to certain economies both of cost and of manpower by the consolidation of [illegible] and the [illegible] of [illegible]. In [illegible] they recommended that [illegible] Medical [illegible] should be admitted to [illegible] on the University. This [illegible] Departmental Committee [illegible] [illegible] [illegible]

anticipated; the policy was not generally approved throughout the University; and, apart from questions of sentiment, its extension would be attended by serious practical difficulties. "As regards the Medical Schools," they reported, "there was not only the difficulty of separating them from their parent hospitals so as to enable them to undergo a form of incorporation, there was also the difficulty of selecting from the twelve general Medical Schools the three which could and should qualify for incorporation." They further laid stress on the point that, whereas the recommendations of the Haldane Commission as regards this Faculty were integrally concerned with the proposed institution of Medical and Surgical Units under the control of University Professors, this policy had since that date been actually carried out (as I shewed in my article of October 1st, 1927) by the natural growth of the University and the development of intimate relations between the Senate and the governing bodies of the several Medical Schools. For these and other reasons, further incorporations were not to be encouraged, still less compulsorily imposed on unwilling Schools. But, for the creation of a closer bond between the University and its constituent administrative units as such, these units should be directly represented on the Senate; further, a new statutory Committee should be established, under the designation "the Collegiate Council," which should advise the Senate on "institutional and inter-institutional matters" in the same way as the Academic Council at present advise that body on the nature and scope of the teaching to be given, subjects of study, curricula, and examinations. With a view to the elimination of an embarrassing heterogeneity of style and the maintenance of a high standard throughout the category of Schools, the Senate should be empowered to weed out the smaller and weaker among them, and to exercise a paramount control in such matters as public appeals for support, the acceptance of benefactions, negotiations for grants, the appointment and titles of principal teachers, and the terms of governing instruments.

(iii) Closely allied to this problem of administrative symmetry was that of financial co-ordination. The University itself, the Committee pointed out, had no resources adequate for the control, or even the guidance, of a comprehensive policy, and this although the total income for the latest year under review of the twenty-two Schools (including for this purpose the two Incorporated Colleges) in receipt of grants from the Treasury amounted to nearly £1,000,000, of which £377,695 represented recurrent grants from the University Grants Committee and £78,366 aid from the London County Council.[6] This was an intolerable situation. "It is," they declared, "fundamentally inconsistent with the idea of a self-governing university that it should not have sufficient financial resources and authority to initiate and pursue a policy of well-balanced development and to prevent wasteful duplication and competition. . . . The University would not be worthy of the name if it were not in its corporate capacity active in initiating, fostering and directing development on a considered and far-seeing plan." This view they supported by impressive quotations from recent Reports of the University Grants Committee[7] and the London County Council,[8] the two largest channels of public financial support; and it has been generally recognised that they have made out an indisputable case for entrusting to the University itself, as statutorily responsible for the execution of a coherent policy throughout its appointed sphere, the various grants that are now or may in the future be made available for this purpose.

(iv) To enable the University to perform effectively these additional duties, a structural alteration was proposed with regard to the exercise of the ultimate authority. Since 1900 the Senate has been its "supreme Governing and Executive Body," charged with "the entire management of and superintendence over" its "affairs, concerns and property," subject only to the provisions of the Statutes of that date. This was now to be changed—not, however, as the Haldane Commission had recommended, by the establishment of a "Court," of "about 200" members, entrusted with ceremonial and legislative functions; this the Committee regarded as a redundant complication. Their design was less elaborate and more directly practical. The Senate, reduced from 56 members to 49, was to remain responsible for educational policy and detail; but a new creation, the "Council," of 16 members, only nine of whom should be members of the Senate, was to be set up "to determine the allocation of funds for the execution of university policy and generally to exercise control over finance." The exact constitution of these bodies and the details of their respective powers and functions, as set out in the Statutes based on the Departmental Committee's Report, will be dealt with later. But the considerations which led the Committee to advocate this partition of the supreme authority between two bodies, each paramount within its own sphere, may most properly be set forth here. "It is not in our view," they reported, "a desirable or practical proposition to charge with the ultimate control of university finance a large body consisting of directly appointed representatives of particular interests. Such a body may well be suitable to formulate policy having financial implications, but in our view there can be no doubt that the deliberations of the Senate would be more effective and its conclusions more judicial if the final decision on financial issues rested with a smaller body on which it was adequately represented, and on which those whom we may call the 'University members' were in a majority." The Council was therefore to consist of nine members of the Senate as against seven non-members—four appointed by the Crown, two by the County Council, and (for it may be taken for granted that he would fall within this category) one expert to be co-opted at their discretion by the other fifteen members.

It was this proposal upon which criticism pounced most promptly and intensively when the Report of the Committee was published in March, 1926; it is the only point upon which the members were not unanimous. Mr. H. B. Lees-Smith, agreeing with all the other recommendations of his colleagues, expressed himself, in a Minority Report, irreconcilably opposed to the transfer of the last word in finance to an independent correlative authority including so large a proportion of persons who were not members of the Senate. He felt it to be essential, if the University was to be "self-governing" in the full sense of the term, that the body charged with the control of its finance should consist entirely of members of the ultimate authority in educational matters—"no University," he urged, "can benefit by the government of men, however eminent, who cannot give the time to enter into its life and understand its problems." He had no objection to the title of "Finance Council" (which would emphasise its proper correlation with the Academic, External, and Collegiate Councils), or to the constitution proposed for it by his colleagues; but it should be, like the present Finance Committee, a subordinate body, in the main advisory, reporting to the Senate on the financial bearings of recommendations submitted on educational or administrative grounds by other Committees. The Senate would thus retain its existing supremacy in finance as in all other departments of the activities of the University.

The Departmental Committee made no direct reference to Mr. Lees-Smith's dissidence on this point,

[6] The totals are at the present time considerably in excess of these figures.

[7] "The University of London," say this Committee, "is in no real sense master in its own house. . . . This is an undignified position for the great University of the capital city of the Empire."

[8] The Council are convinced that their total grant in aid of University education in London should be given as a "block grant to the Senate," but state that, "while the constitution and powers of the Senate remain as at present," they cannot adopt this arrangement.

but they justified their novel scheme in a series of weighty paragraphs in which his objections are met, as are also those which have since been raised by various parties on the grounds that there would be a grave risk of constant delay, friction, and possible deadlock, and that in any case the dignity of the Senate would suffer grievously by such abridgment of their powers. Accepting fully the contention that "in the last resource finance determines policy," they pointed out that they had given the Senate "preponderance" on the Council, and that "substantial agreement on the Senate in matters of policy would thus profoundly influence the views and decisions" of that body. Moreover, the Council, with its smaller and more homogeneous membership, would be far better fitted than the Senate, the members of which were appointed on other grounds by a variety of constituencies and must necessarily be controlled by more formal procedure, to effect "the practical, expeditious and final adjustment of means to ends." To which deliberate vindication by themselves of their own action may be added the reflection that, in actual fact, there is no great administrative authority in the country—whether the governing body of a School or Hospital, a Borough Corporation or County Council, or even His Majesty's Ministry itself—which would lightly ignore or over-rule the considered protest of its financial advisers, even though these exercised a directly subordinate function confined to advisory representations. And on the point of prestige it should be borne in mind that the six or seven non-members of the Senate would, from the nature and conditions of their appointment, be no unsympathetic intruders thrust upon the University from outside, but one and all keenly interested in its prosperity and progress, though the very qualities to which they owed their seats might have rendered it impossible for them to accept a full share in its administration.

The remaining paragraphs of the Departmental Committee's Report deal with the nature of the offices of Vice-Chancellor and Principal, the constitution of the Senate and its several Standing Committees, the question of delegation and sub-delegation of powers, the removal of tiresome restrictions in procedure, the composition and functions of the Faculties and Boards of Studies, the area within which the University should operate, and the organisation of student activities. No vital or markedly controversial principles being involved in their recommendations upon any of these topics, it will be sufficient to summarise them as finally embodied in the new Statutes, with such explanations as may indicate to what extent and with what object, as shewn in the Committee's Report, they modify or extend the Statutes at the present moment in force.

The Act of Parliament that followed upon the Government's approval of the Committee's Report received the Royal Assent on December 15th, 1926. By this Act eight Commissioners were appointed, with Mr. Justice Tomlin as Chairman,* "to make Statutes for the University . . . in general accordance with the recommendations contained in the Report of the [Departmental] Committee, subject to any modifications which may appear to them to be expedient. . . ." They were specifically forbidden to make any Statute disturbing the accomplished incorporation of University College or King's College in the University, or actually to incorporate in the University any existing College, School, or other institution, any such action being reserved for future agreement between the parties concerned. They were further directed, before definitely making any Statute, to facilitate by all suitable means the submission of representations by the Senate or other competent parties in the University or by other bodies or persons directly affected thereby.

The new Statutes were signed and sealed on July 23rd, and these it will be my business to summarise in a concluding article.

* The other Commissioners were Sir Ambrose Selby-Bigge, [illegible] Clerk, Sir Josiah Stamp, Sir George Perry, Dr. A. D. [illegible] Master of Balliol, Dr. Dorothy S. Phillipotts (formerly [illegible] Girton), and Prof. T. P. Nunn. With regard both [illegible] and with the teaching departments and specially [illegible] a position to place exceptional experience at the [illegible] College, Lately Consulting Physician at [illegible] Hospital, for twenty-seven years Dean of Guy's Hospital, [illegible] a member of the Senate, in the appointment of [illegible] from 1911 to 1916 and from 1919 to [illegible] and to be appointed Pro-Vice-Chancellor from 1919 to [illegible] Vice-Chancellor from 1921 to 1926.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Private Practitioners and the Public Medical Services.

THE rapidly ripening problem of the relation between the private practitioner and public clinics of every kind is now receiving serious attention, and the new reforms in concentration of the public medical services give an admirable opportunity for investigating the relations of the private practitioner (insurance and other) to the available institutions for diagnosis and treatment. Stark opposition from the profession will no longer serve any good object. The growth of institutional equipment for diagnosis alone proves that large sections of everyday medicine are beyond the clinical competence of the average practitioner. It is necessary only to mention the polygraph, the electrocardiograph, and the X ray apparatus. No practitioner can be properly required to provide those appliances for himself, and yet no practitioner educated in modern methods would wish to work entirely without them. It follows that every practitioner should have access to the finely equipped departments at the large hospitals.

The Aim of the Social Worker.

In a recent address Prof. E. P. Cathcart, F.R.S., now Regius Professor of Physiology in the University of Glasgow, spoke strongly of the need of men and women for an outlet for the creative artistic spirit which all possessed in some degree. The social worker, he believes, should concentrate not so much on alleviation of fatigue in workshops as on alleviating and curing the boredom of free time. By giving the mind of man something on which it could concentrate more would be done than by clearing slums. He would like the Workers Educational Association and similar bodies to give the workers material not only for the brain, but for the hands—material that would give them opportunities for creation.

Cruelty to Children.

The Royal Scottish Society for Prevention of Cruelty to Children, founded in 1884, is one of the most important and active societies in Scotland. Last year there were 7235 complaints in which its intervention was asked, and these covered 10,160 parents and 21,156 children. There were 72,599 visits of supervision and 15,509 visits of inquiry. This gives some idea of the work done all over Scotland by this admirable organisation. At the recent annual meeting Lady (Leslie) Mackenzie, commenting on the difficulty of raising funds, suggested that, in the Edinburgh district alone, a farthing rate would raise all that was wanted, instead of the nominal sum of £12 contributed by parish councils. After expressing her shame that such a society should be necessary in the twentieth century, she pointed out that among the causes of ill-treatment were drink, bad housing accommodation, immorality, laziness, and unemployment. It was questionable, she suggested, whether the society was getting to the root of the problem. Sometimes those responsible for the ill-treatment of children required the attention of a mental doctor, and if something could be done for mentally deficient women she felt sure that the number of cases of fiendish ill-treatment would be reduced. The work of the society was one of the best bits of social reconstruction being performed, and she felt that the money should come in

with a little less exertion on the part of a certain few people.

A primary defect in the Act, which was (somewhat prematurely, it appears) hailed as the Children's Charter, is that under it there is no single authority responsible for administration. For an Act that consolidates some 40 difficult criminal statutes a strong executive authority is demanded. This defect was pointed out years ago and a new inquiry into the working of the Act was suggested; but in the great flux of reforming events since the war this little item has excited no attention. Possibly in the new reforms something may be done.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Proposed Extension of Compulsory Insurance.

CLUB practice under the Workmen's Insurance Act is the principal source of income for the great majority of medical men in Germany. There is but little chance of private practice, owing to the decline of the former middle classes, affecting nearly everyone except certain employers of labour, the higher Government officials, and members of the liberal professions. So far well-paid employees have been exempt from compulsory insurance whilst workmen have been compulsorily insured according to the amount of their wages. The Act of 1911 limited compulsory insurance to those with an income of M.2500, this figure having since been raised to M.3600. Now, however, the Government intend to make insurance compulsory for all employees whose salary does not exceed M.6000 (£300) a year, and even for some classes of small tradesmen. The proposal is favoured by the sick-clubs, but has caused great alarm in the medical profession. Much has already been suffered by the recent extension of insurance to the families of insured persons, and it is feared that the new Bill will take away what is left of private practice, so that medical men will be more and more dependent on the clubs. Resolutions of protest have been passed by various medical bodies, based on various objections. The united Medical Chambers of Germany have petitioned against the Bill on the ground that there are private insurance institutions in which well-paid employees can insure themselves without any contributory payment by their employers. To well-paid employees the high contribution to the public insurance is disproportionate to the benefits received, which are the same for every class of the insured, whether the amount they pay is large or small. Under the new scheme, says the resolution, the medical profession would lose its independency; individual treatment under the club regulations would be replaced by schematic treatment, whilst the satisfaction medical men are deriving from their work would be reduced and they would suffer still further distress. The Leipziger-Verband have passed a similar resolution in which they point out that a proportion of medical practitioners are not admitted to club practice either because they have not been long enough settled in their respective place of residence or for some other reason. Some of them having already created for themselves a fairly satisfactory private practice, the extension of compulsory insurance to persons hitherto outside the clubs would deprive many medical men of their practice without compensation, and so be unconstitutional. The medical faculties of several universities, notably those of Munich and Würzburg, have protested. They regard the extension of compulsory insurance to sufficiently paid employees and to certain categories of small tradesmen as a further step towards the socialisation of medicine, which is apparently the aim of the Government.

Misuse of Orthopædic Appliances.

Orthopædic appliances are sometimes given rather lavishly by municipal authorities to patients not belonging to sick-clubs who, in the opinion of the municipal medical officers, require them to recover their working capacity. Prof. Rost, chief surgeon to the municipal hospital of Mannheim, by sending nurses to the homes of the patients has lately made an inquiry whether the appliances distributed were really in use. The result of the inquiry was rather astonishing. Of 45 supporting corsets only 19 were regularly employed, and the same proportion, 19 out of 45, was given for walking-splints. Of patients with an amputated arm only 20 per cent. were wearing their artificial arm. Of five plaster-of-Paris beds only one was used. The percentage was satisfactory only for orthopædic shoes, 46 out of 50 being regularly worn. This was attributed to the fact that the patients in this way could save the costs of ordinary shoes. Some of the people concerned declared to the nurses that they were wearing their appliances for some hours every day, but this was obviously untrue. The money spent by the municipality on these appliances is thus for the most part wasted.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are statistics for 1927 for four county boroughs:—

Name of county borough and estimated (R.-G.) population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Diarrhœa, &c., under 2 years.	Maternal mortality from childbirth.
Derby .. .. (136,400)	18·0	12·5	0·70	1·38	2·7	1·8	68/41	3·2	2·8
Walsall .. .. (102,000)	20·8	12·7	1·11	1·10	2·8	1·9	96/41	8·5	4·2
Warrington .. (78,680)	19·6	10·8	1·27	1·12	2·4	1·7	77/27	5·1	6·4
Smethwick .. (76,870)	17·0	11·9	0·90	1·19	2·8	1·9	78/25	9·9	3·0

The pre-school mortality-rates per 1000 births were: Derby, 43; Walsall, 50; Warrington, 36; and Smethwick, 53.

Derby.

Dr. A. E. Brindley reports an increase in the general death-rate largely due to influenza. The deaths attributed to influenza numbered 113, nearly as many as those attributed to bronchitis and pneumonia respectively, which is quite unusual. There were 135 notifications of small-pox with no deaths. Dr. Brindley is convinced that the principal factor in keeping alive the disease in the town and its reintroduction from outside districts, is the failure to elicit full information as to contacts. He would like legislation to make the giving of such information compulsory. As in many other districts new cases of syphilis show a decline and new cases of gonorrhœa an increase at the clinics. The number of scarlet fever cases admitted to the isolation hospital was 162 with no deaths. Treatment with antitoxin was adopted in the latter part of the year "with highly satisfactory results." There were 205 cases of diphtheria admitted with 7 deaths—a low case-fatality of 3·4 per cent. Since early in 1926 new nurses have been immunised against diphtheria and there have been no cases among the nursing staff. Early in 1927 two nurses developed scarlet fever, since which time scarlet immunisation has been adopted, successfully up to the present.

Of 32 samples of untreated milk three were found to be tuberculous and as a result one infected cow from a town byre was slaughtered. The other two samples were of "outside" milk.

Walsall.

Dr. James A. M. Clark says: "The housing question does not appear to be much nearer a solution as many bad cases of overcrowding are being constantly met with." A special effort was made during the year to secure the renovation of 250 of the worst houses. The work proceeded slowly and a number of the owners would have preferred Closing Orders. Many of the houses dealt with were occupied by more than one family without any conveniences for such dual or triple occupation. "The crying need in our present housing situation," says Dr. Clark, "is the provision of a self-contained dwelling at such a rent as will suit the income of the poorer classes, and, until some such provision is made, overcrowding and indecent occupation of rooms, leading to ill-health and immorality, will persist."

There were 344 notifications of diphtheria and 39 deaths, a case-mortality of 11·33 per cent. For three years immunisation facilities have been offered at the welfare centres with little response. Greater success was obtained in 1927 by a campaign in the schools with the coöperation of the teachers. During the last six weeks of the year 797 children and 52 adults in six schools were Schick-tested and the reactors immunised. Mr. Percival Mills, who conducts the orthopædic clinic, points out the great advantage of the continuous treatment and supervision now available for the crippled children of Walsall, as compared with the past, when these children could only obtain their treatment by repeated journeys to Birmingham. During the year 184 cases were treated at the clinic.

Warrington.

Dr. G. W. N. Joseph reports that the housing problem has been somewhat relieved by the 348 municipal and 473 private enterprise houses built during the year. There are still 226 applicants living in overcrowded conditions. The Bewsey Estate of the corporation will provide 40 acres for housing and 27 acres for playing fields and recreation grounds. The municipal houses include 40 wooden huts with two bedrooms, living room, scullery, larder, w.c., &c. The larger huts are let at 9*s.* 5*d.* weekly, including rates, and the smaller at 7*s.* 5*d.* The lowest inclusive rentals among the remainder of the 600 municipal houses are 42 houses at 11*s.* 6*d.* weekly. In those houses which were relieved by the committee's selection of tenants during the year, the average number of occupants was 4·2 persons per bedroom.

An outbreak of small-pox (35 cases) originated in the poor-law hospital in December and continued in January, 1928. The type was mild and caused no deaths, but one man of 70 years died from intercurrent heart disease.

An orthopædic scheme, conducted by Mr. Harman Taylor, of Liverpool, came into operation in June, 1927, and dealt with 29 boys and 26 girls of the pre-school age.

Smethwick.

Dr. Hugh Paul says the outstanding feature of the year was a disastrous outbreak of influenza, chiefly in the first quarter, which increased the general death-rate, the infant mortality, and the respiratory death-rate for the year. The housing problem is still acute and "large number of families are living under most deplorable conditions." The houses built are only sufficient to provide for the increase of the population. There are 550 houses in need of reconstruction or demolition. The tenants of these slum houses would not, as a rule, be able or willing to pay the rents of better houses far removed from their work.

Dr. Paul thinks that antenatal work is showing its effect on the maternal and neonatal mortalities, and it is estimated that 30 per cent. of the pregnant women attended the antenatal clinic during 1927.

Toxoid antitoxin has been made available free of charge to medical practitioners for the prophylaxis of diphtheria, but little use is being made of this facility.

At the end of July there were fifteen cases of dysentery (three fatal) in a ten-room house occupied by several families. A water-tank showed the presence of intestinal organisms and had been used for drinking purposes. A carrier, who had contracted this type of dysentery in the east, was living in the house.

MENTAL HOSPITAL REPORTS.

The *City of Portsmouth Mental Hospital* at *Milton* had 918 patients in residence at the end of 1927. The recovery-rate for the year was 29·9 per cent. and the death-rate 7·83 per cent. Of 75 deaths, 20 were due to general paralysis, 12 to kidney disease, and 7 to senile decay. There was no enteric or dysentery during the year, and only 7 cases of tuberculosis. Weekly cinema entertainments were much appreciated, and community singing has been started by means of broadcasting selected records through a gramophone attachment. The wireless has not yet ousted the hospital orchestra from its place in dances and entertainments. The out-patient clinic is doing good work; 171 new patients were seen in 1927, bringing the total to 872. The pathological laboratory has been re-equipped and a pathological assistant has been appointed. The work is steadily increasing. A new villa has been built, but further extension will be necessary. The visiting dentist has done a good deal of work. Parole is granted to 27 patients outside and to 110 inside the estate, and 50 patients were allowed out on trial before discharge. Two male and three female wards are administered on the "open door" principle. Thirty-seven men and 26 women nurses are certificated or registered; there is difficulty in getting suitable women probationers.

The *South Yorkshire Mental Hospital* at *Wadsley, Sheffield*, housed 1849 patients at the end of 1927, and additional accommodation, which had become very necessary, was obtained by opening a new hospital for boys and a new one for adult men, and by increasing the beds in the women's residence. The recovery-rate for the year was 39·9 per cent. and the death-rate 9·9 per cent. Autopsies were held on 95 per cent. of those who died. There were five cases of enteric fever during the year and one of dysentery, while 25 patients suffered from tuberculosis. There was also some erysipelas, influenza, and chicken-pox. Twenty-six cases were certified as suffering from the after-effects of epidemic encephalitis. The visiting physician remarks on the difficulty of detecting tuberculosis in insane patients and welcomes the provision of an X ray apparatus, which is also to be accompanied by an ultra-violet light installation. The visiting surgeon did a number of operations. The work of the visiting dentist is increasing, and much has to be left undone for want of time. Many male patients are usefully employed on the estate and on the farm, which last year gave excellent returns. Some of the women are busying themselves with the poultry and others work in the laundry and sewing rooms and about the houses. Thirty patients are allowed full parole and 21 are free within the estate. 190 have been granted leave of absence for a few days, and a canteen for the sale (by token) of small luxuries is much appreciated. General paralysis is being treated by induced malaria. Of 114 cases who have been treated, 17 are well and employed outside the hospital, 9 are well but unemployed, 21 are improved, and 24 died. One sufferer from epidemic encephalitis improved after malarial inoculation, and the method is therefore being tested for these cases. In addition to routine work the pathologist has carried out several lines of research. An additional solarium, continuous bath and more open air verandahs are in course of construction. During the year six attendants and eight nurses passed the final examination of the Medico-Psychological Association, one nurse obtaining honours. A quiet "study room" has been provided for nurses and attendants. Two senior nurses fully trained in surgical and medical as well as in mental work have been appointed.

MENTAL DEFECTIVES.

The twenty-ninth report of the *Incorporated Lancashire and Cheshire Society for the Permanent Care of the Feeble-Minded* records a successful year of work, marred only by the impossibility of keeping pace with the demands for beds. A new house for 50 youths was opened last year, but the vacancies so formed could have been filled three times over. No more girls and women can be admitted, and the need continues urgent. To those who feel that the 371 beds at Sandlebridge are but a drop in the bucket, the secretary points out that if the 200 adult patients had been left uncared for there might by now have been 600 instead of 200, for the feeble-minded reproduce themselves more rapidly than any other class of the community. The inmates are happy and work steadily at various handicrafts. An unfortunate outbreak of scarlet fever caused many difficulties and kept out new patients for a time. An ophthalmic surgeon now pays quarterly visits. An urgent appeal is made for funds for this excellent work.

POOR-LAW REFORM.

THE GOVERNMENT'S PROPOSALS.

THE following account of the First Part of the new Local Government Bill is based on an explanatory memorandum [1] on the Bill's provisions.

1. Part I. of the Bill gives effect to the proposal to transfer the responsibilitiy for poor-law administration to counties and county boroughs, as a necessary accompaniment of the scheme of rating reform. Clause 1 accordingly transfers, as from April 1st, 1930, the functions of boards of guardians to the councils of counties and county boroughs comprising the unions for which the boards of guardians act. If a union overlaps two or more counties or county boroughs, it will be divided among them. Clause 3 requires each council within a specified time after the passing of the Act to submit for the Minister's approval a scheme of the administrative arrangements to be made for discharging its new functions.

2. The poor-law will thus be transferred to authorities which already provide services, including institutions for medical treatment and other purposes, which overlap similar provision made by boards of guardians for persons who are destitute. Clause 4 accordingly gives power to the council to deal with destitute as well as other persons by means of the services which they provide under the special Acts mentioned in the clause. It is left to the council to determine whether they will avail themselves of this power, subject always to the maintenance of their legal obligations in regard to the relief of destitution. (The Lunacy Acts are excluded.) Other parts of the same clause permit the county council to make arrangements for cases appropriate for attention under the Education Act or the Maternity and Child Welfare Act, 1918, to be dealt with by those councils of county districts (*non-county boroughs or urban or rural districts*) which are separate education or maternity and child welfare authorities.

Public Assistance Committees.

3. Other classes of case (or, if the council do not elect to avail themselves of the power given by Clause 4, all cases) which require public assistance for the relief of destitution will be dealt with under the poor-law. Clause 5 accordingly requires the council to provide in its scheme for the establishment of a poor-law committee, called in the Bill the Public Assistance Committee, which may be either a new or an existing committee and may be assisted, if desired, by the inclusion of a minority of members not members of the council, among whom women must be included. All business relating to the transferred functions, except raising a rate or borrowing money, will stand referred to this committee. It may also have executive functions delegated to it, so that it can give decisions without having to wait for confirmation by the council.

4. As members of a county council will not be able personally to deal with applications for poor-law relief from all over the county Clause 6 (1) (*a*) and (*b*) provides for division of the county into areas of one or more county districts in each of which a sub-committee of the Public Assistance Committee (to be called the Guardians Committee) of not more than 24 nor less than 12 members is to be set up, consisting of (1) members of the councils of the county districts in the area, nominated by the councils; (2) the locally elected members of the county council; and (3) members up to one-third of the total (among whom could be included aldermen of the county council) appointed by the county council.

5. It is not, however, intended that these committees shall be responsible for the provision of institutional treatment or, except as explained below, for the management of institutions. One object of the proposals in the Bill is to secure that existing institutions shall be used and developed to the best advantage. This involves the setting apart of particular institutions in the county to serve particular classes of inmates or particular purposes, for some of which a highly qualified staff and highly specialised apparatus may be found to be required. The organisation of the institutional service on these lines can only be undertaken, it is suggested, by a body viewing the needs of the county as a whole. But it will still be for the guardians committees by arrangement to send applicants for relief to the institution provided to meet their special needs and they will, if requested by the public assistance committee, be enabled to visit, report on, or manage institutions. Clause 6 (1) (*c*) accordingly enacts that provision is to be made in the county scheme for placing on the guardians committee the duty to

(1) Consider and examine applications for relief;
(2) Determine the nature and amount of the relief to be given;
(3) Determine what part of the cost of relief shall be recovered from the recipient or from those liable for his maintenance;
(4) Inspect, report on, or manage a poor-law institution in their area, if requested to do so by the public assistance committee.

The guardians committees will exercise the above functions subject to such restrictions or conditions as the county council may impose. The appointment and dismissal of officers will, moreover, remain in the hands of the county council.

6. To minimise the possible risk of loss of touch or absence of understanding between the guardians committees and the central public assistance committee Clause 6 (2) provides that a guardians committee shall be entitled to send a representative to participate in (but not to vote at) meetings of the public assistance committee when business relating to its area is to be transacted.

7. It has been shown in para. 5 that the prescribed organisation reserves to the county council the control of all services requiring the provision of institutions, in order to ensure that the institutions may be used to the best advantage. The position in county boroughs is the same. It will, however, be necessary for the councils of counties and county boroughs to make provision, as local authorities and boards of guardians now have wide power to do, for certain classes of case which are of regular occurrence, but relatively few in number. It is suggested that the most economical way of making this provision may be a combination of two or more councils for the purpose; thus it has been found convenient to make provision in one central institution in London for the radiological treatment of certain varieties of cancer. Experience is stated to have shown that the most effective control of vagrancy can be secured by the coöperation of authorities covering a wide area.

Clause 2 (1) and (2) accordingly gives power to councils to move the Minister to make an Order for their combination, and to the Minister, after making himself acquainted with the views of the local authorities and ratepayers concerned,

[1] Ministry of Health: *Local Government Bill, 1928.* Cmd. 3220. H.M. Stationery Office. 1928. 6*d*.

by Order to require two or more councils to combine for any purpose connected with their new functions under the Act, where such combination would tend to diminish expense or would otherwise be of public or local advantage. Subclauses (3) and (4) make provision for the administrative machinery necessary where combination takes place, and subclause (6) provides that any Order made by the Minister must be laid before Parliament and is subject to annulment on an address to His Majesty by either House of Parliament.

8. In order that the knowledge and experience of local conditions, which have been acquired by local authorities, shall be available in the final settlement as well as in the actual operation of the scheme, Clause 7 (1) provides that notice must be published by the county or county borough council in local newspapers that a scheme (see para. (1)) has been submitted to the Minister for approval, that a copy of it is open to inspection, and that representations on it may be made to the Minister within four weeks of the publication of the notice. Subclause (2) provides that the Minister must, before approving a scheme, consider any representations made to him by local authorities or other persons who appear to him to be interested. Subclause (3) provides that, if a council fails to submit a scheme, the Minister may himself make one, after consideration of any representations submitted to him by any local authorities.

9. In county boroughs also it may be necessary for the town council to seek the assistance of persons other than members of the council in the actual administration of their poor-law functions. Clause 6 (4) therefore gives the councils power to appoint subcommittees of the public assistance committee, in which a minority of persons not members of the council may be included. Subclause (4) (2) provides that the coöpted members shall include women, and that "regard shall be had to the desirability of including persons who are members of poor-law authorities immediately before the appointed day, and other persons of experience in the matters delegated or referred to the subcommittee."

Recovery of Costs.

10. The alterations in the arrangements for administering the poor-law which have been outlined in the foregoing paragraphs call for some modifications in the personal position of those who are affected, whether as administrators or beneficiaries.

(*a*) *Administrators.*—Clause 9 extends to membership of councils of counties and county boroughs and of the public assistance committee and its subcommittees the disqualification due to the receipt of poor-law relief, but puts an end to the present disqualification in the case of medical or surgical treatment.

(*b*) *Beneficiaries.*—Under the poor-law there is an obligation on the board of guardians where possible to recover the whole or part of the cost of relief from the recipient or from the persons liable to maintain him. Public health authorities, while they have a power to secure a recovery of this kind, are under no obligation to recover the cost of assistance given by them—e.g., under their tuberculosis and maternity and child welfare schemes—and the practice differs in different parts of the country.

Since it will be open to councils of counties and county boroughs in future to elect to give assistance in suitable cases either under the poor-law or under the special Acts, it might happen that repayment would be required from persons receiving assistance because they were destitute and had recourse to the poor-law, but not from persons applying for it for their own convenience. Similar differences would arise between persons similarly situated persons in different counties or county boroughs, according as the powers conferred on the councils by Clause 4 were or were not exercised.

The Memorandum points out that while the protection of the public health requires that a person suffering from an infectious disease should be given every inducement to seek hospital treatment, it is no less necessary that there should be no temptation to persons who can afford to pay the whole or part of the cost to look to public funds for free treatment and maintenance whenever they are ill. Nor is it desirable that the practice adopted in regard to the recovery of costs should vary in different localities. Clause 13 accordingly provides that it shall be the duty of the council to recover the whole or such part (if any) of the cost of maintenance as the patient or those liable for his support can reasonably pay, in all cases where persons receive *institutional treatment*, otherwise than for infectious disease (which includes tuberculosis and venereal disease). The present power of a local authority to recover the whole or part of the cost of assistance given under the special Acts (other than institutional treatment) remains unimpaired. Where treatment (or assistance) is given under the poor-law, the poor-law obligation to recover is left intact.

11. Certain amendments of, or additions to, the law relating to the functions of local authorities are also necessary. Among them Clause 11, Subclauses (1) and (2) confer on county councils the powers possessed by local sanitary authorities to provide hospitals for the sick, and extends the power so as to include ordinary maternity cases. Power is also conferred on councils to make subscriptions to voluntary hospitals. Subclause (4) removes the present restriction which prevents mental deficiency committees from treating poor-law mental defectives.

Subclauses (3) and (5) enable public health and mental deficiency committees of county or county borough councils to appoint subcommittees, consisting wholly or partly of members of the committees, and the first subclause gives the power (already existing in regard to the mental deficiency committee and other committees under the special Acts) to include in the public health committee, to the extent of one-third, persons not members of the council.

12. The following are the principal special provisions which apply to London. Clause 15 (*a*) and (*b*) leaves it to the London County Council to make arrangements for the local administration of poor relief by their administrative scheme, which will be *subject to approval by the Minister*. Subclause (*d*) provides that the London County Council shall absorb the Metropolitan Asylum Board, whilst Subclause (*f*) provides that the Common Council of the City and the councils of the metropolitan boroughs shall be responsible for vaccination and registration.

13. Arrangements are made for special cases in which boards of guardians under local Acts have powers which would not conveniently be fitted into a county scheme or hold property for charitable purposes. Clause 17 gives power to the Minister to postpone the transfer of poor-law functions from boards of guardians appointed by him under his special powers until April 1st, 1935.

The remaining parts of the Bill are briefly described in our Parliamentary columns.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED NOV. 3RD, 1928.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 122 (last week, 148); scarlet fever, 3096; diphtheria, 1347; enteric fever, 28; pneumonia, 889; puerperal fever, 35; puerperal pyrexia, 107; cerebro-spinal fever, 1; acute poliomyelitis, 8; encephalitis lethargica, 26; dysentery, 9; ophthalmia neonatorum, 84. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Nov. 6th-7th was as follows: Small pox, under treatment 11, under observation 2; scarlet fever, 2715; diphtheria, 1935; enteric fever, 25; measles, 68; whooping-cough, 276; puerperal fever, 17 (plus 10 babies); encephalitis lethargica, 71; poliomyelitis, 2; "other diseases," 20. At St. Margaret's Hospital there were 16 babies with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 5 (3) from enteric fever, 11 (0) from measles, 6 (0) from scarlet fever, 19 (5) from whooping-cough, 42 (7) from diphtheria, 68 (21) from diarrhœa and enteritis

under two years, and 61 (13) from influenza. The figures in parentheses are those for London itself.

The fatal cases of enteric fever outside London were reported from Salford and Sheffield. Three fatal cases of measles were reported from Walsall and 2 each from Coventry and Liverpool. Cardiff reported 6 deaths from diarrhœa, Manchester 4, and no other town more than 3.

The number of stillbirths registered during the week in the great towns was 271 (corresponding to a rate of 40 per 1000 births), including 39 in London.

Correspondence.

"Audi alteram partem."

GENERAL MEDICAL COUNCIL: ELECTION OF DIRECT REPRESENTATIVES.

To the Editor of THE LANCET.

SIR,—May I express my warmest thanks to all concerned for their generous support of my candidature in the recent election? The large number of votes recorded indicates an increased interest in the work of the Council, and will be to me an added stimulus to devote my best ability to the work, and to endeavour to justify the confidence placed in me.

I am, Sir, yours faithfully,

Wimborne, Nov. 6th, 1928. E. KAYE LE FLEMING.

To the Editor of THE LANCET.

SIR,—May I, through the medium of your columns, thank all those who voted for me in the recent election of two Direct Representatives as members of the General Medical Council. I shall endeavour to justify their confidence.—I am, Sir, yours faithfully,

Luton, Nov. 10th, 1928. JOHN W. BONE.

THE "RANGE OF UREA-CONCENTRATION" TEST.

To the Editor of THE LANCET.

SIR,—Would you allow me to correct a slight error in my letter in your last issue. In making my first comment on the urea-index 4·8 I really had in mind Dr. Hunt's *general* statement on the "urea-index" and this I omitted to quote: "This is of particular service in the recognition of the presence and degree of nitrogen retention." My remark, therefore, should have been that such low indices as 4·8 were not in keeping with the normal blood-ureas generally obtained in this particular form of kidney disease.

I am, Sir, yours faithfully,

Harley-street, W., Nov. 8th, 1928. E. G. B. CALVERT.

To the Editor of THE LANCET.

SIR,—Dr. Calvert has been kind enough to show me his further letter to you on this subject. To avoid any misconception I should also like to emphasise the point to which he refers and to make clear that the calculation of the urea-index—a matter which does clearly not affect the actual carrying out of the test—was not suggested to act as a guide to the condition of the blood-urea in the hydræmic type of nephritis, but to repeat that it was in the cases I had grouped as "chronic interstitial nephritis" that it has been of value "as a useful index of nitrogen retention." It has the advantage of associating the three variants (maximum concentration, minimum concentration, and range of urea) under one figure, and showed itself to be of assistance when considering a number of cases, and in estimating to some extent the state of nitrogen retention in the cases of "contracted kidney" which were described.

Calvert's test has been in cases of "large white" kidney perhaps least reliable, and this applies with especial force to any such formula as the urea-index. As Dr. Calvert rightly states, "urinary tests of function have a very limited value in acute or subacute kidney conditions where œdema or hydræmia is present." This is particularly to be regretted, since he insists that "it is preferable to base our diagnoses or classification on the results of function tests" and "to rely rather on ability than appearances." It was with the hope that a better insight into function might be obtained that I proposed extending the dilution part of Dr. Calvert's test over a longer period; though it is perhaps true that "prolonged and elaborate investigations with the water test may, unless great care is taken, lead to wrong conclusions," it is unfortunately also true that the shorter test as originally suggested by Dr. Calvert has, in the actual cases that were under consideration, sometimes itself led to wrong conclusions.

I am, Sir, yours faithfully,

St. Mary's Hospital, W., Nov. 12th. T. C. HUNT.

ATYPICAL OR MILD ENTERIC.

To the Editor of THE LANCET.

SIR,—In your last issue (p. 972) Dr. Eustace Thorp reports seeing a large number of cases simulating typhoid fever, but with a negative Widal reaction. Several of these cases later showed a positive reaction, even long after convalescence. My object in writing is to report the seeing of a series of cases of differing disorders, prevalent for some weeks, and much more so in the last few days, all of which show as the most positive finding marked acetonæmia. Many of these cases showed a temperature up to 104° F., especially in children, gradually coming down one degree per day—if treated on anti-acidosis lines—finally reaching normal almost coincident with the alkalising of the urine (generally about a week). These cases have been masquerading under such diagnosis as meningitis, pneumonia, appendicitis, typhoid, paratyphoid fever, or toxæmia of pregnancy; but they all show the same urinary findings and respond to the same line of treatment. The urine frequently shows organisms of the colon bacillus group, and I have assumed that these cases were due to some form of the bacillus which had become pathogenic—perhaps *B. fæcalis alkaligenes*. Investigations are being made along these lines, as negative Widal reactions have been returned in what seemed a typical case of typhoid.

May it not be a case of the soil disturbance—i.e., liver and blood chemistry—being the more important factor in these cases, activating into pathogenicity *any* organisms which may be present in a particular field? The condition is on a par with the situation where one sees a run of suspicious diphtheritic throats in an institution, but where all are reported as negative—only streptococci or micrococci, &c., being found—until the last case, it may be, comes back with a positive report for diphtheria. In all such cases, I consider, it is more the question of the disturbed blood state activating all germs present in such people's throats. The clinical appearance may be similar in all.—I am, Sir, yours faithfully,

Darlington, Nov. 10th, 1928. R. CHALMERS.

"THE FOUR PLAGUES OF EGYPT."

To the Editor of THE LANCET.

SIR,—In a leading article last week under this heading, wherein you refer to my presidential address to the Tropical Section of the Royal Society of Medicine, you make use of expressions which are not mine and with which I wish to dissociate myself. You write that Egypt is "physically rotten." This she is not, or the fellaheen would not show, as they undoubtedly do, such a marvellous change in character, appearance, and physique once they have got rid of the bilharzia and ankylostomiasis. Certainly the fellah is bowed down physically and mentally by the weight of the handicap of his endemic diseases,

but this is no more discredit to him than illness is to one of a more fortunate race.

I spoke of the 14,000,000 fellaheen, the most important numerically and the most unfortunate portion of the community, and the import of my remarks was that England can render them considerable aid by watching over their medical interests, so that the Egyptian nation may the sooner avail themselves of the benefits they will assuredly reap from the fine institutions which they have built up under British guidance. The question of diabetes is irrelevant. The Egyptians are a semitic race, and diabetes may be somewhat prevalent amongst the upper classes, but it has no effect on national character or outlook. Sexual perversion I know little about. I was 17 years in Egypt and the Sudan and came across insufficient evidence to warrant so wide a statement as you print.

I am, Sir, yours faithfully,

J. B. CHRISTOPHERSON.

Devonshire-place, W., Nov. 11th, 1928.

BORNA DISEASE.

To the Editor of THE LANCET.

SIR,—In your review last week (p. 984) of the important report on Borna disease by Nicolau and Galloway, published by the Medical Research Council, it is stated—quoting the report—that the disease is still unknown in the British Isles. Might I be allowed to point out that, though rare, the disease does occur here. Some years ago I had the opportunity of examining part of the central nervous system of a pony which developed the disease in the Island of Skye. Details of this case were published with a photograph of the lesion in a recent communication (*Proc. Roy. Soc. Med.*, February, 1928), where it was pointed out that the lesion shows great similarity with that of acute poliomyelitis.

I am, Sir, yours faithfully,

JAMES MCINTOSH.

Bland-Sutton Institute of Pathology, Middlesex Hospital, London, W., Nov. 13th, 1928.

MATERNAL MORTALITY IN CHILDBIRTH.

To the Editor of THE LANCET.

SIR,—The Minister of Health, as you announced on p. 944, proposes to hold an inquiry into each maternal death in the country. This, as far as it goes, is a step in the right direction, although it is applied at the wrong time.

There are three causes for the maternal death-rate, and they may be stated as (1) marriage of unfit persons; (2) inadequate antenatal work; and (3) housing conditions and overcrowding.

It is of little use making exhaustive inquiries *after* the event. To prevent such an incidence as 4 per 1000, it will be necessary to attend to these three points: (1) For the first point, medical examination and a "fit" certificate should be compulsory for both parties to a marriage. (2) *Every* pregnant woman should be examined (at a clinic or otherwise) by a medical man, and measured, and advised. As to (3) better housing conditions should be a first consideration, when the appalling condition of childbirth, occurring in a room occupied by children, probably only divided from the unfortunate woman by a curtain, if at all, will cease to exist.

Until these elementary things are attended to, it will be useless to attempt to reduce mortality below 4 per 1000.—I am, Sir, yours faithfully,

W. J. GRIFFITHS.

Chester, Nov. 13th, 1928.

NOTTINGHAMSHIRE ORTHOPAEDIC HOSPITAL.—Last week the Duchess of Portland laid the foundation stone of the new Orthopaedic Hospital for Nottinghamshire at Harlow Wood. The building, the site for which has been given by the Duke of Portland, will cost £[illegible].

Obituary.

SIR NESTOR TIRARD, M.D., F.R.C.P. LOND.

WE record with regret the sudden death on Nov. 9th of Sir Nestor Tirard, who will be remembered as a physician who contributed much to the exactitude of medical treatment. He was in his seventy-sixth year, and death was due to cerebral hæmorrhage.

Nestor Isidore Charles Tirard was a singularly brilliant student. He took honours in zoology at the preliminary scientific examination; he took the gold medal in physiology at the London intermediate, and again the gold medals in forensic and obstetric medicine at the London final in 1877. His teachers at King's College were proud of these successes, which were but the beginning of a career of great distinction, for Tirard became a really learned man. At this time he was senior scholar and associate of King's College. He acted as vice-president of the Medical Society, sub-dean and medical tutor to the College, and lecturer on physiology and comparative anatomy to the evening classes. At King's College Hospital he served as house physician and Sambrooke surgical registrar before being appointed (1885) assistant physician, and in due course (1892) full physician, retiring in 1919, when he was appointed consulting physician. During the greater part of this time he was also on the staff of the Evelina Hospital for Children and physician to the Church Missionary Society and to St. Luke's Hostel. The completeness and breadth of his learning assured his choice as professor of the principles and practice of medicine; but only those who engaged him in conversation came to realise the profundity of his medical knowledge. As a physician Tirard was a master of the art of examination and of the deductions which could be made upon its results. His Text-Book of Medical Treatment, Diseases, and Symptoms (1900) was designed to help the student with a manual in which treatment held first place, but the book was more than a therapeutic treatise, for it dealt broadly with preventive and remedial measures for morbid conditions, and being written in a pleasing and attractive way, with sound and reliable instructions, the students of the time had good reason to be grateful to the writer. Apart from this systematic work Tirard wrote mostly on clinical matters—Bright's disease, diabetes, antitoxin treatment—his meaning always being expressed in fluent English; lucidity of expression was indeed his aim, and he liked to admire it in the writings or speeches of others. No sacrifice of time or temper was too great to attain it. His laborious care in choice of words sometimes seemed excessive, but it was needed for the work he had to do. The accuracy of his drafting was utilised in the Therapeutic Substances Act and especially in relation to the Pharmacopœia.

SIR NESTOR TIRARD.

He was also an extremely good linguist and his help was for that reason in great demand at international conferences.

Tirard gave freely of his time and labour to the advancement of pharmacopœial knowledge and to the improvement of pharmacopœial organisation. He was appointed editor of the Pharmacopœia Committee of the General Medical Council in 1895 and he was secretary of that committee at the time of the publication of the B.P. 1898. In that year he was requested to act as reporter to the committee on advances in pharmacology and therapeutics bearing on the Pharmacopœia and he was responsible for the Indian and Colonial Addendum of 1900. In June, 1910, he took part in the Paris conference which discussed proposals for an international understanding on the subject of Methods and Standards of Analysis in relation to food and drugs. In the following year he was appointed one of the editors of a new Pharmacopœia, and on resigning his secretaryship of the Pharmacopœia Committee in 1915 on account of pressing war duties a resolution of the Council placed on record an appreciation of his 20 years' service.

He examined in medicine for the Royal College of Physicians of London over a period of 15 years or more; he was a councillor from 1908–10, and in 1914 he delivered the Bradshaw lecture in which he made some clinical contributions to the study of glycosuria. The graphic records which were the basis of this lecture, the result of close coöperation with the pathological department of King's College Hospital, were effective in showing the relative influence of dietetic and medicinal treatment, leaving no doubt as to the paramount importance of diet. The lecture contained also a notable contribution to the relation of glycosuria to gangrene. During the war Tirard was appointed Lieut.-Colonel commanding the 4th London General Hospital and received the honour of knighthood in 1916. From 1922–27 he was a member of the General Medical Council as a Crown nominee, acting as hon. secretary to the Pharmacopœia Committee and representing the Council at the International Pharmacopœial Conference in 1924. He was also a member of the advisory committee for the testing and marking of glassware used for scientific purposes.

In spite of all these claims upon his time Tirard kept familiar with contemporary work in medicine and its outlying sciences, and although he did not enter the arena of research his judgment and criticism upon it were sound and enlightening. "I have often discovered," writes one of his colleagues, "how valuable was his advice when I wished to elucidate a difficult point." In hospital practice his juniors found him willing to give advice when it was required, and he took endless trouble in so doing. One who knew him best writes that he "always found him extraordinarily wise." He was fond of children, who responded to his generous and warm-hearted nature. For pastimes he was devoted to sketching in water-colours, and on returning from holiday he would bring with him a large album which was a source of pleasure in retrospect. Part of his leisure he spent in fishing.

Sir Nestor Tirard married in 1885 Helen Mary, daughter of the Rev. R. S. Beloe, by whom he had one son and two daughters.

JOHN MACINTYRE, M.B., LL.D., F.R.F.P.S. GLASG., F.R.C.S. EDIN.

THE medical profession in the West of Scotland loses a prominent member by the death of Dr. John Macintyre on Oct. 29th. The son of Donald Macintyre, he was born at Glasgow and educated at the University there. After graduating in 1882 he gained post-graduate experience at Vienna and returned to Scotland to practise chiefly as a laryngologist. He was appointed assistant surgeon to the Glasgow Royal Infirmary, subsequently becoming surgeon for diseases of the throat and nose, and lectured on the same subject both at the University and at Anderson's College, where he was dean of the Medical Faculty. Twice President of the British Laryngological, Rhinological, and Otological Society, he was a Fellow and corresponding member of several foreign associations in the same specialty, being for some years joint editor of the *British Journal of Rhinology, Otology, and Laryngology*. From an early stage of his career, however, he also took a keen interest in the development of radiology. Quick to realise the importance of X rays, he was one of the first in Glasgow to make use of them in his work, and he began a long series of contributions to the literature of medical electricity and physics as long ago as 1885. His investigations on X rays were demonstrated to the Royal Society of London towards the end of last century, and Macintyre won general recognition as a capable and ingenious experimenter. He was elected president of the Rontgen Society and received the Fellowship of the Royal Society of Edinburgh. In 1918 he became a Fellow of the Royal Faculty of Physicians and Surgeons, and two years later was made a Doctor of Laws by his University. He was a justice of the peace and in 1917 was appointed a deputy-lieutenant for the city.

An enthusiastic yachtsman, Dr. Macintyre held a Lieut.-Commander's commission in the Royal Naval Volunteer Reserve. He married the daughter of the late H. R. Hardie.

Dr. JOHN CASHIN, whose death occurred in London on Oct. 28th, was for 35 years in practice at Southsea. Born in 1856 at Clogheen in Co. Tipperary, the son of Michael Cashin, of Cooldevane House, he was educated at Mount Mellarey Abbey School, the College School, Waterford, and Queen's University, Dublin. Qualifying in 1880, he became resident medical officer at the Jervis-street Hospital, and later resident obstetric officer at the Rotunda Hospital. After post-graduate training in London and Berlin and two years' service in the Royal Navy, he took up gynæcological practice in London, obtaining the diploma of F.R.C.S. Irel. in 1890. He was appointed surgeon to out-patients at the South London Hospital and assistant physician to the Soho-square Hospital for Women, and published several books on gynæcological subjects. Eventually, however, he decided to leave London and take up general practice at Southsea. A few years ago he was joined in partnership there by Dr. Warren Meade. During the war Dr. Cashin was in medical charge of troops at Portsmouth Barracks and was made an officer of the Order of the British Empire for his services. He married a daughter of Thomas Were Fox, of Plymouth.

Dr. JAMES CROSSLE SCOTT, whose death has occurred in Ireland after several months' illness, was an Ulsterman by birth and studied medicine at the University of Dublin. He graduated in 1902, proceeded to the M.D. degree in the following year, and at once entered private practice at Merton Park, Wimbledon. From 1916 until the end of the war he served as medical officer in various hospital ships, but afterwards resumed his work at Merton, where he was joined last year by Dr. Taylor Harris. He was 54 years of age, and leaves a widow with three children.

BOLTON INFIRMARY EXTENSIONS.—A gift of £10,000 to the Bolton Infirmary by Miss Barnes, of Bolton, in memory of her brother, is the second donation of £10,000 to the infirmary within a few weeks, the other gift being raised out of the estate of the late Mr. Colin Cooper. The joint sums will be used to build the first of four new hospital blocks, each containing two wards. The four additional blocks are intended to give 160 additional beds, a new out-patient department, a new operating theatre, and other offices. A contract has also been placed for the building of a new nursing home at Newlands, Chorley-new-road, to cost £30,000, the gift of the Haslam family. An X ray and sun-ray treatment department, built and equipped at a cost of £6000, was opened on Nov. 8th by Mrs. Tom Jackson, who, with her husband, gave the money for its construction.

Medical News.

UNIVERSITY OF CAMBRIDGE.—At a congregation on Nov. 9th the following degrees were conferred:—

M.B. and B.Chir.—H. H. Stewart, W. P. Purvis, and D. J. MacMyn.

M.B.—Hon. W. S. Maclay.

The Gedge Prize for original observations in physiology has been awarded to Mr. W. A. R. Rushton, Ph.D., of Pembroke College.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At a meeting of the Council on Nov. 8th Sir Berkeley Moynihan, the President, in the chair, Richard Anderson Hickling, M.B. Camb., M.R.C.P. Lond., of the Westminster Hospital, was appointed the fourth Streatfeild scholar, the subject of his research being an Investigation of the Living Cells of the Blood and of Effusion into Serous Cavities by Means of Sabini's Supravital Staining Technique in Clinical Cases. The Diploma of Fellow was conferred upon Roland Hodgson Boggon, of St. Thomas's Hospital, who has now complied with the by-laws of the College.

Diplomas of Member were conferred upon 157 candidates (139 men and 18 women) who have passed the requisite examinations and have complied with the by-laws of the College. The names of these candidates appeared in our issue of Nov. 3rd, in the list of licentiates of the Royal College of Physicians, with the exception that H. T. Flint (Westminster), Margaret C. Rosser (Birmingham), and H. Joomye (Middlesex) have previously received the diploma of M.R.C.S., and H. Bernstein (University College) will receive the L.R.C.P. diploma at a later date.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.—Dr. R. A. Fleming, the President, took the chair at a quarterly meeting of the College on Nov. 6th, when Dr. W. T. Benson and Dr. R. H. H. Newton were introduced and took their seat as Fellows of the College. Dr. J. D. Stuart Cameron and Dr. A. N. S. Carmichael were elected to the Fellowship. Hill Pattison-Struthers Bursaries were awarded as follows: Anatomy and Physiology, Wai-Ming Tso: Clinical Medicine, Alan Mackenzie Fraser.

ROYAL SOCIETY OF ARTS.—On Wednesday, Dec. 12th, at 8 P.M., a lecture on Applications of Electricity to Medical Practice will be given by Mr. G. G. Blake, M.I.E.E., at the Royal Society of Arts, John-street, Adelphi, London, W.C. Sir Oliver Lodge, F.R.S., will preside.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL. Three lectures, illustrated by lantern slides, on the History of Medicine will be delivered at the school by Dr. Charles Singer on Nov. 19th and 26th, and Dec. 3rd, at 4.15 P.M. The lectures will be on small-pox, plague, and diphtheria respectively, and are open to all medical students of the University of London.

BRITISH SCIENCE GUILD.—The Norman Lockyer lecture for 1928 will be given by Prof. J. Arthur Thomson, Regius Professor of Natural History in the University of Aberdeen, at 4.30 P.M. on Wednesday, Nov. 28th, in the Goldsmiths' Hall, Foster-lane, London, E.C. His subject will be the Culture Value of Natural History. A few tickets are still available and may be had from the Secretary of the Guild, 6, John-street, Adelphi, W.C. 2.

BRITISH SERBIAN UNITS.—The annual re-union dinner of the British Serbian Units Branch of the British Legion and of all friends of Serbia will be held at the Victoria Mansions Restaurant, Victoria-street, Westminster, on Saturday, Dec. 1st, at 7.15 P.M. The President, Dr. Alice Hutchison, in the chair. Tickets may be had from Mr. J. R. Chappell, the interim hon. secretary, 123, Queen's-road, W. 2.

CLINICAL SOCIETY OF BATH.—A meeting of this society was held on Nov. 2nd at the Royal United Hospital, with Mr. A. de V. Blathwayt in the chair. Mr. J. S. Levis showed a case of elephantiasis of the leg of unknown origin, in which he had performed Kondeleon's operation with great success. The œdema had disappeared and the leg was almost normal in size. The patient had returned to his work as a labourer. Dr. R. G. Gordon exhibited a cinematograph film illustrative of some abnormal gaits in children, as exemplified by some of the patients at the Bath Orthopædic Hospital. He stressed the point of the educability of many cases of cerebral diplegia which had hitherto been generally looked upon as a condition of imbecility. He cited several cases of children at the Orthopædic Hospital, who in addition to being taught to feed themselves and to walk, could also read, write, sew, and typewrite.

UNIVERSITY OF GLASGOW.—On Nov. 10th the degree of Doctor of Medicine was conferred on James Baird.

UNIVERSITY OF ST. ANDREWS.—Dr. John McGibbon, formerly of the University of Witwatersrand, Johannesburg, was on Nov. 9th formally installed to the Chair of Midwifery and Gynæcology in the University, in succession to Prof. J. A. Kynoch.

UNIVERSITY OF LONDON MEDICAL GRADUATES' SOCIETY.—The first extra-metropolitan dinner of this society will be held at the Queen's Hotel, Birmingham, at 7.30 for 8 P.M., on Friday, Nov. 23rd, with the President, Sir StClair Thomson, in the chair. Any University of London medical graduates wishing to be present are asked to communicate with Prof. W. Billington, 58, Harborne-road, Edgbaston, Birmingham.

NEW HEALTH SOCIETY.—A festival dinner of this Society will be held at the Mayfair Hotel, Berkeley-street, London, W., at 7 for 7.30 P.M., on Thursday, Nov. 29th, with Sir Charles Wakefield in the chair.

NORTH-WESTERN TUBERCULOSIS SOCIETY.—Dr. S. Vere Pearson, physician to Mundesley Sanatorium, will read a paper on Pitfalls in the Diagnosis of Pulmonary Tuberculosis on Thursday, Nov. 22nd, at 3.15 P.M., at the Public Health Laboratory, York-place, Oxford-road, Manchester. The attendance of all medical practitioners is invited.

FOREIGN DECORATIONS.—The King has given to Major B. H. C. Lea-Wilson, K.A.M.C., P.M.O., Egyptian Army, authority to wear the Insignia of the Third Class of the Order of the Nile, conferred upon him by the King of Egypt; and to Mr. A. Copland, district surgeon, authority to wear the Insignia of the Third Class of the Order of the Brilliant Star of Zanzibar, conferred upon him by the Sultan of Zanzibar.

DUBLIN UNIVERSITY BIOLOGICAL ASSOCIATION.—The opening meeting of this Association was held last Saturday evening in Trinity College, Dublin, having been postponed from Oct. 27th on account of the death of Mr. L. L. Cassidy. The President, Dr. D. G. Madill, delivered an address on Some Aspects of Midwifery in Early Times and in the Middle Ages. The speakers were Prof. Munro Kerr (Glasgow), Prof. C. G. Lowry (Belfast), Prof. T. G. Moorhead (Dublin), and Mr. L. G. Gunn.

MITCHAM COTTAGE HOSPITAL.—Princess Mary last week opened the Wilson Cottage Hospital at Mitcham, in Surrey, which has been given with an endowment by Mr. and Mrs. Isaac H. Wilson at a cost of about £60,000. The accommodation comprises wards with ten beds each for men and women, a children's ward with six beds, and four private wards. Two cots are to be given by the Prudential Assurance Co.

PRESENTATIONS TO MEDICAL MEN.—In June last Prof. L. P. Gamgee retired from 35 years' service to Birmingham General Hospital as successively resident surgeon, honorary assistant-surgeon, and honorary surgeon, and accepted the position of honorary consultant surgeon. Last week his long service was commemorated by the presentation of an address from the board and the medical staff, while the Lord Mayor, as President of the hospital, was asked to accept a portrait of Prof. Gamgee to be hung in the board-room. In his speech Prof. Gamgee attributed the distinguished position of the institution to the fact that it forms part of a flourishing medical school.—Dr. John Hedley Marsh, J.P., medical officer of health for Macclesfield, has been presented by his fellow practitioners in Cheshire with a corner cupboard, a bookcase, and a chair. A panel of the bookcase is formed by an illuminated address which reads as follows: "Presented to Dr. John Hedley Marsh, J.P., by the members and constituents of the County Palatine of Chester Local Medical and Panel Committees in recognition of his spirited leadership and of a decade of genial and judicious conduct in the chair." A Japanese garden enclosed in an oval porcelain tray was also presented to Mrs. Marsh, and a complimentary luncheon followed the presentation ceremony, but Dr. Marsh was unable to receive in person the tributes of esteem from his colleagues owing to illness.—On Nov. 7th Dr. Arthur Maddock Jones, of Bala, North Wales, was presented with an inscribed gold cigarette case and a cheque for a substantial amount on behalf of the inhabitants of the Bala district, in appreciation of his services while at Bala as medical officer for the Bala and Penllyn Councils, and as secretary of the Bala Golf Club. Dr. Jones will take up practice in Llandudno.

PHYSIOLOGY AND NATIONAL EFFICIENCY.—A lecture on this subject was delivered at King's College, Strand, on Nov. 14th, by Prof. R. J. S. McDowall, Dr. Andrew Balfour being in the chair. Prof. McDowall explained how national efficiency depended on the efficiency of the individual—and that to be efficient a man should always be capable of doing his best in the minimum time and with the minimum waste of material. He described how accurate rationing was based entirely on experiments performed in physiological laboratories, performed in the first instance in the pursuit of pure science; and further, how physiological investigations had resulted in the discovery of remedies for scurvy, rickets, diabetes, and many other ills.

DONATIONS AND BEQUESTS.—Miss Sarah Sutton, Coventry, left £1000 to the Coventry and Warwickshire Hospital, and £100 to the Coventry District Nursing Association.—Mr. John Hart, Maida Vale, London, W., left £1000 to such charitable institutions or objects as the executors may determine, and £250 each to the London Hospital, the Metropolitan Hospital, and the Jews' Hospital and Orphan Asylum; £200 to the Jewish Home for Incurables, St. Dunstan's Hostel; and £150 each to the Evelina Hospital for Sick Children, and the Hospital for Epilepsy and Paralysis —Mr. H. C. Sayer, of Sheffield left, among other bequests, £1000 to St. Dunstan's Hostel for Blinded Sailors and Soldiers, and £100 to the Sheffield Royal Infirmary.

ULSTER MEDICAL SOCIETY.—The second meeting of the session was held at Belfast on Nov. 8th, with the President (Prof. T. H. Milroy) in the chair. Dr. J. S. Campbell read a paper on the Coronary Circulation in Relation to Coronary Disease, based on his recent research into the anatomy and pathology of the coronary circulation, as seen by injection of barium into the vessels and their subsequent radiography (see THE LANCET, July 28th, p. 168). He dealt, first, with the variations in the normal arrangement of the arteries and their anastomoses, and the changes which are associated with age—i.e., diminished vascularity of the right side of the heart, greater tortuosity, and more complex anastomoses of vessels. He then showed that thrombosis was relatively common, and found only in vessels previously diseased; that thrombosis was, in certain cases, compensated by a generous anastomosis, and, in particular, that the cardiac neuromuscular tissue is protected by a specially rich blood supply. Dr. Campbell illustrated his remarks by a series of lantern slides of his injected hearts as seen by X rays, and demonstrated the normal and pathological coronary circulation. Dr. J. E. MacIlwaine, Dr. S. B. B. Campbell, Dr. R. Marshall, Mr. S. T. Irwin, and the President joined in the subsequent discussion, and in congratulating Dr. Campbell on his fruitful research.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
TUESDAY, Nov. 20th.—5.30 P.M., GENERAL MEETING OF FELLOWS. Ballot for election to the Fellowship. 8.30 P.M., PATHOLOGY. Papers: Norah H. Schuster; Bilateral Lung Carcinoma. G. M. Findlay: Ultra-violet Light and Cancer. T. Izod Bennett: The Relation between Œdema and Nephritis.
THURSDAY.—8.30 P.M., UROLOGY. Paper: Mr. D. M. Morison: Routes of Absorption in Hydronephrosis. Experimentation with Dyes in Total Ureteral Obstruction.
FRIDAY.—5 P.M., DISEASE IN CHILDREN. (Cases at 4.30 P.M.) Paper: Dr. H. M. M. Mackay: Nutritional Anæmia in Infancy: Some Observations on a Common Deficiency Disease. 8 P.M., EPIDEMIOLOGY. Paper: Dr. H. P. Newsholme: Individuality and Epidemic Disease.

ROYAL INSTITUTION, Albemarle-street, W.
THURSDAY, Nov. 22nd.—5.15 P.M., Dr. E. D. Adrian, F.R.S.: The Mechanism of the Nerves.

MEDICO-LEGAL SOCIETY, 11, Chandos-street, Cavendish-Square, W.
THURSDAY, Nov. 22nd.—8.30 P.M., Dr. L. A. Weatherly: Juvenile Psychologic Delinquencies: their Origin and Treatment. To be followed by a discussion.

CHELSEA CLINICAL SOCIETY.
TUESDAY, Nov. 20th.—8.30 P.M. (at the Hotel Rembrandt, Thurloe-place, London, S.W.), Mr. N. D. Bellis (Messrs. Abdulla and Co., Ltd.), Dr. W. E. Dixon, F.R.S., and Dr. G. E. S. Ward, will open a discussion on Tobacco. The meeting will be preceded by dinner at 7.30 P.M.

ROYAL SOCIETY OF ARTS, John-street, Adelphi, London, W.C.
WEDNESDAY, Nov. 21st.—8 P.M., Sir Gerald Bellhouse, Chief Inspector of Factories: Safety in Factories.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Nov. 19th, to SATURDAY, Nov. 24th.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Lecture by Mr. L. C. Rivett: The Signs and Symptoms of the Common Disorders of the Menopause, on Mon., at 5 P.M.—CHARING CROSS HOSPITAL, Charing Cross, W.C. Tues., 11 A.M. Clinical Demonstration by Mr. Graham Brown in the Ear, Nose and Throat Department.—CENTRAL LONDON OPHTHALMIC HOSPITAL, Judd-street, W.C. Thurs., at 3.30 P.M., clinical demonstration by Mr. Cardell.—ROYAL CHEST HOSPITAL, City-road, E.C. Tues., at 4.30 P.M. Clinical lecture by Dr. Saxby Willis: Bronchiectasis.—WELLCOME MUSEUM OF MEDICAL SCIENCE, 33, Gordon-street, W.C. Wed., demonstration by Dr. E. G. Ffrench on The Ætiology of Various Skin Diseases at 4 P.M. There are no fees for the above.—ROYAL WATERLOO HOSPITAL, Waterloo-road, S.E. Special post-graduate course in medicine, surgery, and gynæcology.—ROYAL WESTMINSTER OPHTHALMIC HOSPITAL, Broad-street, Holborn, W.C. Special Course.—ST. PETER'S HOSPITAL, Henrietta-street, W.C. Special Course in Urology.—WEST END HOSPITAL FOR NERVOUS DISEASES, 73, Welbeck-street, W. Lecture-demonstrations, illustrated by cases from 5 P.M. Further information from the Secretary.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, Nov. 19th.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Simmonds: Surgical Out-patients.
TUESDAY.—11 A.M., Mr. Endean: Venereal Diseases (demonstration). 2 P.M., Dr. Shaw: Medical Out-patients. 2 P.M., Mr. Hamblen Thomas: Throat, Nose and Ear Department.
WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. 2 P.M., Mr. Tyrrell Gray: Operations. 2.30 P.M., Mr. Donald Armour: Surgical Wards.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 2 P.M., Dr. Ironside: Medical Out-patients. 2 P.M., Mr. Bishop Harman: Eye Department.
FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department.
SATURDAY.—9 A.M., Mr. Vlasto: Operation on Throat, Nose and Ear. 9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Diseases of Children.
Daily 10 A.M. to 5 P.M., Saturdays 10 A.M. to 12 noon. Medical and Surgical In-patients and Out-patients. Operations, Special Departments, Anæsthetic Course.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, Nov. 19th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.
WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin and Eye Clinics. Operations.
THURSDAY,—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.
FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.
WEDNESDAY, Nov. 21st.—4 P.M., Prof. Sir Thomas Oliver: Lead Poisoning in Industries.

CHADWICK PUBLIC LECTURES.
WEDNESDAY, Nov. 21st.—5.15 P.M. (at the Medical Society of London, 11, Chandos-street, W.), Dr. E. P. Cumberbatch: Physicotherapy, with Special Reference to Medical Electricity.
THURSDAY.—8 P.M., The above lecture will be repeated at the Guildhall, Bath.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, Nov. 22nd.—4 P.M., Dr. Gray: Tuberculosis of the Skin in Children.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, Nov. 23rd.—4 P.M., Mr. Gill-Carey: Diagnosis of Sinusitis.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.
TUESDAY, Nov. 20th.—3.15 P.M. (at the Royal Chest Hospital), Dr. E. Maxwell: Heart Failure and Rapid Digitalis Treatment.

ST. PAUL'S HOSPITAL POST-GRADUATE COURSE, Endell-street, W.C.
THURSDAY, Nov. 22nd.—4.30 P.M., Sir Thomas Carey-Evans: Stone in the Bladder, with Special Reference to Treatment by Litholapaxy.

UNIVERSITY COLLEGE, Gower-street, W.C.
MONDAY, Nov. 19th.—5 P.M., Prof. E. B. Verney: Urinary Secretion. (Last lecture.)

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY, Nov. 20th.—5 P.M., Dr. J. A. Drake: Leprosy.
THURSDAY.—5 P.M., Dr. A. Whitfield: Tuberculosis Cutis (I).

GRESHAM COLLEGE, Basinghall-street, E.C.
TUESDAY, Nov. 20th.—6 P.M., Sir Robert Armstrong-Jones: Care of Mental Illness.
WEDNESDAY.—6 P.M., The Brain and Sense Organs.
THURSDAY.—6 P.M., The Old and New Psychology.
FRIDAY.—6 P.M., Sleep (Gresham Lectures on Physic).

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL.
MONDAY, Nov. 19th.—4.15 P.M., Dr. Charles Singer: Small-pox. First of three lectures on the History of Medicine.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.
TUESDAY, Nov. 20th.—4.15 P.M., Dr. W. Fletcher Shaw: Post-menopausal Hæmorrhage.
FRIDAY.—4.15 P.M., Dr. W. G. Thomson: Some Problems in Psychiatry.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.
FRIDAY, Nov. 23rd.—3.30 P.M., Mr. Nutt: Ophthalmic Signs and Symptoms in Certain General Medical Conditions.

Appointments.

BARRON, H. THOMPSON, M.D. Lond., M.R.C.P. Lond., has been appointed Honorary Physician to the Skin Department, Croydon General Hospital.

CRITCHLEY, M., M.D. Brist., M.R.C.P. Lond., Junior Neurologist to King's College Hospital.

LESTER-WILLIAMS, R., M.B., B.Chir. Camb., F.R.C.S. Eng., Surgeon, with Charge of Out-patients at the Seamen's Hospital, Greenwich.

MATTHEWSON, G. D., F.R.C.P. Edin., P.M.O. of the Scottish Widows' Fund and Life Assurance Society.

SHUTTLEWORTH, EDITH A., M.B., Ch.B. Leeds, Resident Medical Officer to Doncaster Poor-law Infirmary.

Certifying Surgeons under the Factory and Workshop Acts: GILCHRIST, T. B., M.D. Glasg. (Langport, Somerset); PHILLIPS, A. P., L.R.C.P. Lond., M.R.C.S. (Chaddesley Corbett, Worcester); and SCOTT, S. N., L.R.C.P. Lond., M.R.C.S. (Plymstock, Devon).

Vacancies.

For further information refer to the advertisement columns.

All Saints' Hospital for Genito-Urinary Diseases, 91, Finchley-road, N.W.—Hon. Anæsthetist.
Birmingham and Midland Homœopathic Hospital, Easy-row.—H.S. £150.
Birmingham, Queen's Hospital.—Asst. Ophth. Surg. £50.
Birmingham University.—Lecturer in Physiology. £400.
Bradford City.—Asst. School M.O. £600.
Bradford, Royal Infirmary.—Res. Surg. O. £250.
Burnley, Victoria Hospital.—H.P. At rate of £125.
Cairo, Faculty of Medicine, Dental School.—Prof. of Dental Surg. and Path. £E.1200.
Cambridge, Papworth Village Settlement.—H.S. At rate of £100.
Cancer Hospital, Fulham-road, S.W.—H.S. At rate of £100. Also Surg.
Cardiff, King Edward VII, Welsh National Memorial Association. Asst. Tuber. P. £600. Also Third Asst. Res. M.O. to N. Wales Sanatorium, Llangwyfan. £200.
Carlisle, Cumberland Infirmary.—Pathologist and Bacteriologist.
Carlisle, Cumberland and Westmorland Mental Hospital, Garlands.—Asst. M.O. £350.
Charing Cross Hospital, W.C.—2nd Surg. Registrar. £150.
Chester, Royal Infirmary.—Three H.S.'s. Each £120.
City of London Hospital for Diseases of the Heart, &c., Victoria Park, E.—Res. M.O. £250. Also H.P. At rate of £100.
Colchester, Essex County Hospital.—Asst. H.S. and Registrar. £120.
Dagenham Urban District Council.—Asst. M.O. for Maternity and Child Welfare. £600.
Dreadnought Hospital, Greenwich.—Asst. Pathologist to London School of Clin. Med. £350. Also Med. Supt. £300.
Durham, Richard Murray Hospital, Blackhill.—Res. M.O. £150.
Eastbourne, Princess Alice Memorial Hospital.—Jun. H.S. At rate of £100.
Eastern Dispensary, Leman-street, E.—Physician.
Elizabeth Garrett Anderson Hospital, Euston-road.—Clin. Assts.
Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £120.
Hampstead Hospital for Children, 30, College-crescent, N.W.—Pathologist. £50.
Hampstead General and North-West London Hospital, Haverstock Hill, N.W.—Hon. Ophth. Surg.
Hexham Rural District Council.—Asst. County M.O. &c. £800.
Hospital for Sick Children, Great Ormond-street, W.C.—H.P. and H.S. Each at rate of £100. Also Res. M.O. for Country Branch Hospital, Tadworth, Surrey. At rate of £250.
Hull, Royal Infirmary.—Second H.S. At rate of £150.
King's College Hospital, Denmark Hill, S.E.—Sister-Matron.
Kirbymoorside, Yorkshire, Children's Orthopædic Hospital.—H.S. £150.
London Clinic, Ranelagh-road, S.W.—Ward Supt. £150.
London Homœopathic Hospital, Great Ormond-street, W.C.—Asst. Phys.
London Lock Hospital, 91, Dean-street, W.—H.S. At rate of £200.
Manchester Hospital for Consumption and Diseases of the Chest, &c.—Res. M.O. £200.
Manchester, Park Hospital, Darnhulme.—Three Res. M.O.'s. One at rate of £150 and two at rate of £120.
Merton and Morden Parishes.—M.O., and Public Vaccinator. £165.
Miller General Hospital for South-East London, Greenwich-road, S.E.—H.P. and H.S. Each at rate of £125.
Poplar Hospital for Accidents.—Hon. Dental Surgeon.
Pontypridd, Llwynypia, Hospital.—Res. Asst. M.O. £300.
Prince of Wales's General Hospital, Tottenham, N.—Hon. Anæsthetist. £20. Also Hon. Clin. Assts.
Reading, Royal Berkshire Hospital.—Hon. Physician.
Royal Free Hospital, Gray's Inn-road, W.C.—Res. H.S.'s and Res. H.P.'s. Each £150. Surg. Reg. £200. Gyn. Reg. and Med. Reg. Each £100. Also Obstet. Dist. Asst. £100.
Royal Waterloo Hospital for Children, &c., Waterloo-road, S.E.—Pathologist. £250.
St. Albans and Mid-Herts Hospital and Dispensary.—Res. H.S. £150.
St. Thomas's Hospital, S.E.—Surgical Registrar.
Sheffield, Jessop Hospital, Norton.—Res. M.O. £150.
Sheffield, Royal Hospital.—Asst. Pathologist. £500.
Sheffield, Royal Infirmary.—Asst. Pathologist, &c. £500.
Southampton, Free Eye Hospital.—Hon. Clin. Asst. and Refractionist.
Surrey County Council, Kingston-upon-Thames.—Asst. M.O. £800.
Swansea Hospital.—H.S. £150.
University of London, South Kensington, S.W.—Geoffrey Duveen Travelling Studentship in Oto-Rhino-Laryngology. £450.
Walsall, General Hospital.—H.S. At rate of £125.
West London Hospital, Hammersmith-road, W.—H.P., H.S. Also Aural and Ophth H.S. Each at rate of £100.

The Chief Inspector of Factories announces the following vacant appointments for Certifying Factory Surgeons: Hanley (Staffordshire), Dewsbury (Yorkshire), and Jedburgh (Roxburghshire).

Births, Marriages, and Deaths.

BIRTHS.

BOWDEN.—On Nov. 8th, at Bryn Bella, Betws-y-Coed, the wife of Dr. T. R. Bowden, of a daughter (stillborn).

RICHARDSON.—On Nov. 3rd, at Palmerston-place, Edinburgh, the wife of Major D. T. Richardson, M.C., R.A.M.C., of a daughter.

MARRIAGES.

DIXON—SEYMOUR.—On Nov. 6th, at St. Martin-in-the-Fields, Joseph Francis Dixon, M.A., M.D., Lieut.-Colonel, R.A.M.C. T.A. (retired), to Helen Scott, younger daughter of the late Charles Pennington Seymour and Mrs. Seymour, of Rushbrooke, Co. Cork.

FAGAN—BEAUCHAMP.—On Nov. 10th, at the Church of St. Peter and St. Paul, Great Missenden, Bucks, Richard Feltrim Fagan, M.B., B.S., D.P.H., of Gerrards Cross, Bucks, to Evelyn Frances Joyce, only daughter of the late Captain W. G. Beachamp, R.I.M.

SELBY—HAILSTONE.—On Nov. 8th, at St. Stephen's, Cheltenham, Harold J. Selby, M.R.C.S., L.R.C.P., to Cara, daughter of the late Commander W. Hailstone, R.N., and Mrs. Hailstone, of Ridgeway, Cheltenham.

DEATHS.

DAVIES.—On Nov. 5th, Philip Lys Davies, M.C., M.B., D.P.H.

SMITH.—On Nov. 2nd, suddenly, at Cork, Major-General J. B. Smith, C.B., C.I.E., I.M.S. (retired), of Gordon-road, Ealing, Medical Adviser to the Secretary of State for India and President of the Medical Board, aged 63.

TIRARD.—On Nov. 10th, suddenly, at Harley-street, Sir Nestor Tirard, M.D., F.R.C.P., aged 75.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE LANCET: SUBSCRIPTION RATES.

		£	s.	d.
INLAND	One Year	£2	2	0
	Six Months	1	1	0
	Three Months	0	10	6
ABROAD	One Year	2	10	0
	Six Months	1	5	0
	Three Months	0	12	6

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

DEBATE ON THE ADDRESS.

THE debate on the motion that an humble Address be presented to His Majesty thanking him for the gracious speech from the Throne was continued in the House of Commons on Thursday, Nov. 8th.

Mr. CLYNES moved the following amendment:—

"But regret that, although your Majesty's advisers have had four years of office with a commanding majority in Parliament, general election pledges remain unfulfilled, the country is burdened with the problem of unemployment in a more acute form, in many mining areas appalling conditions prevail, the proposals outlined in the gracious speech are utterly inadequate to meet the existing industrial situation and ignore the need for [illegible] tions of labour, and, in particular, regret [illegible] pledge with respect to factory legislation [illegible] that it is the declared intention of your Majesty's advisers not to honour it during this Parliament."

He said that perhaps the worst of the broken pledges standing to the account of the Government since they took office in 1924 related to factory legislation. That was a matter which must not be treated lightly, affecting as it did the lives and health of many millions of operatives in this country. It was some 25 years since there had been any general revision or treatment through any comprehensive Act of Parliament of factory life and conditions. The Prime Minister had informed the Leader of the Opposition that the reason why the Factory Bill found no place in the programme for this session was that there was no time. All the Prime Minister's supporters must have felt from the tone in which that statement was made that the Prime Minister himself knew that it was a most feeble and unconvincing reply, and carried no weight whatever in any quarter of the House. The Home Secretary at the beginning of the session of 1926 made this statement:—

"I desire with the full authority of the Prime Minister to state clearly and distinctly that the pledges to pass the Factories Bill during the course of the present Parliament are not only not to be waived, but are this night emphasised by me on Mr. Baldwin's behalf."

A little later, on March 26th, the Home Secretary said in the House:—

"The Factories Bill will be one of the principal measures of next year, and we will do our utmost to pass it into law. That is a categorical statement which I have been authorised to make."

The English language could not go further. But in spite of these expressed declarations and repeated assurances and reassurances they had now the statement from the Prime Minister that there was no time to do anything of the kind. The Prime Minister had denied that there was any pressure exerted to cause the Government to withhold their hand in respect of this particular Bill. If it were true that it was their own spontaneous act, done of their own free will, the case against them was all the greater. There surely was ground for some suspicion of pressure when they followed the terms in which Ministers had addressed themselves to this question. The Home Secretary, speaking on Oct. 28th, 1927, said:—

"The Bill will make balustrades and staircases in factories compulsory. Fancy balustrades being regarded as rank Socialism! It will make mechanical shuttles take the place of the present methods and conserve the health of women. Every week one man is killed in mills through being caught in overhead shafts. Is it rank Socialism to prevent that? If so, I would be ashamed of the Conservative party if they failed to prevent it."

He (Mr. Clynes) would like to know the measure of the Home Secretary's shame when at the end of this debate the division was to be taken on the question of this gross violation of repeated pledges. He was quite certain that if the Conservative conference at Yarmouth had been as enthusiastic in demanding the Factories Bill as it was in demand of the Anti-Trade Union Bill the Factories Bill would have been passed into law.

Mr. CHURCHILL (Chancellor of the Exchequer) said that it must not be thought that the feelings of distress which the appalling conditions in parts of our coalfields had caused was confined to any one party. He repulsed the suggestion that there was any want of humanity in the British treatment of the unemployment problem. There was no country in the world where direct taxation of the rich and wealthy in all its forms was carried so far. There was no country where so great a proportion of the national income was spent on the relief of sickness, old age, unemployment, destitution, widowhood, and orphans. He had taken some advice on this point, and although he admitted that the figures could not be taken as precise, yet he thought that it would be true to say that man for man and woman for woman we in these islands provided two or three times as much—and it might be four and five times as much—as any other country in the world, including the most wealthy and also the most Socialistic country, for the care of the sick and the poor. When they examined the course of events which had occurred in their lifetime, surely they must feel that the problem of unemployment, grave and serious as it was, was of all others one which should not be used for ordinary party purposes; it was one which they should treat as a common problem which British men and women should try to face together. British industries were classified for the purpose of unemployment statistics into 100 groups, and in those groups there were now about 1,000,000 wholly unemployed persons. But of that number half were found in only nine groups, and it was upon those nine groups that more than half of the whole rating relief which the Government proposed to give to industry would be concentrated. In the remaining 91 industrial groups, considered as a whole unemployment had for the last two or three years remained relatively low; it had actually lessened in the last three or four years. The improvement in general industry, and especially in basic industries, was the first hope of providing new openings for displaced miners.

Mr. Clynes had referred at some length to the failure of the Government to fulfil pledges in regard to the Factories Bill. The Government proposed to appeal to the country at the first moment after their de-rating Bills had been passed and the necessary financial business had been settled. How, then, was there time for a Factories Bill as well as the de-rating Bills? The Government had had to choose between the de-rating measures, which were their main contribution to trade revival and the relief of unemployment, and this desirable factory legislation. Could anyone doubt that it would be wrong to delay a general election for the sake of the Factories Bill, or to give a Factories Bill at this time priority over de-rating legislation? When de-rating had brought its relief to industry the Factories Bill would follow naturally. On the whole, the conditions in the factories of this country were better than those which prevailed on the continent of Europe. But they could not say that British industries were in a more favourable position than the industries of the continent. With trade and unemployment as they were at present it was absolutely necessary that a measure of relief should precede and not follow additional regulations, however desirable.

The debate was adjourned.

Tuberculous ex-Service Men.

The debate was resumed on Monday, Nov. 12th.

Mr. HAYES drew attention to the Government's policy in regard to tuberculous ex-Service men. He said that it might not be generally known that the treatment of these men, whose disability was accepted as due to war service, had been handed over by the Ministry of Pensions to the Ministry of Health. A case of a man, aged 50, in Liverpool, who was in receipt of 100 per cent. pension for tuberculosis, had come to his notice. The man was living in a slum with five other members of his family. On the advice of his panel doctor the man applied for sanatorium treatment, but he was informed by the local representative of the Ministry of Pensions that his case had been referred to the local authority, which in Liverpool was the Port Sanitary Hospitals Committee. After consideration that Committee decided that they could not admit the man to any of their sanatoria. He had therefore to return home to bed. What he (Mr. Hayes) was concerned about was the statement by the local authority that they could not admit this man to a sanatorium while there were other patients on the waiting list who have not yet had an opportunity of benefiting from sanatorium treatment. Further, the local authority stated that sanatorium accommodation on Merseyside was fully occupied, so that if this man was given a bed another patient would be deprived of it.

Dr. DRUMMOND SHIELS said that the unemployment problem had not been seriously tackled. Since the war we had spent nearly £400,000,000 just to keep people alive, and no more than alive. We had nothing to show for it, and we had subjected these people to a very serious ordeal and to great suffering and privation. After the war, the problem should have been tackled just like the war, and we ought to have had a general staff to deal with it. It was not sufficiently realised that the amount which was given in unemployment relief was not sufficient to maintain physical health in those to whom it was given. Undoubtedly, there was a very large amount of ill-health and malnutrition throughout the country. The Ministry of Health sometimes stated that there seemed to be evidence that people were making claims for national health insurance who were not entitled to do so. He believed a very great deal of that was primarily due to unemployment, and that the physique and health of the people were being steadily undermined by it. That in itself, from the point of view of the physical

fitness of our nation, especially in view of the revelations of the war, was a subject which should appeal to all patriotic people. While he was in favour of emigration, he was very anxious that conditions in Canada and Australia should be such as would justify them in encouraging people to go there. A great deal of injustice had been done to the disabled ex-Service men. They had found it practically impossible to obtain work, and many of them, with their small pensions, had had a very miserable time. Their pensions ought to be brought up to the subsistence level.

Dr. VERNON DAVIES said that if the Labour Party, instead of going about making so many vain promises, would concentrate on the work to their hand, and see that the conditions of the workers abroad were brought closer to English standards, we should very quickly overcome one of the great causes of unemployment. Dr. Shiels had spoken about unemployment benefit, but he was criticising an Insurance Act and not a relief scheme. It was never suggested that the money paid under that Act would be sufficient to keep a healthy man or woman in good condition, but it was an insurance scheme, and those concerned were getting a good return for their contribution. Unemployment was a great problem and was causing great anxiety in the country. People generally had no conception of what people in Lancashire had been going through during the last seven years. Recently, in Lancashire, he was astonished to see how well-dressed the people were, but he was told that in more than one place they were saving money on their food. They were not spending half as much on food as in the good times. We could not afford that, and he suggested that if an opportunity occurred the Prime Minister or the President of the Board of Trade should offer his services to bring peace in the cotton industry.

Mr. RHYS DAVIES said that in some of the mining districts local authorities who had hitherto been able to provide meals for necessitous school-children were in dire financial straits. In a little district in his division called Aspull there was a population of 7000. Nearly all the pits were closed and some of the men had been unemployed for two, three, and even four years. The infantile mortality-rate, which was 85 per 1000 for Great Britain as a whole, was 128 per 1000 in that area. The Government ought really to study the terrible effect of unemployment on infantile mortality as well as on mortality generally. The figures relating to the payment of sickness and disablement benefits to the insured population of this country were an additional proof that our people were suffering much more severely than many Members of the Government would admit.

The Labour Party amendment was rejected by 321 votes to 151—majority against, 170.

LOCAL GOVERNMENT REFORM.

Mr. CHAMBERLAIN (Minister of Health) on Monday, Nov. 12th, presented in the House of Commons a Bill to amend the law relating to the administration of poor relief, registration of births, deaths, and marriages, highways, town planning, and local government; to grant complete or partial relief from rates in the case of the hereditaments to which the Rating and Valuation (Apportionment) Act, 1928, applies; to discontinue certain grants from the Exchequer, and provide other grants in lieu thereof.

Sir JOHN GILMOUR (Secretary of State for Scotland) presented a Bill to transfer to county councils and the town councils of certain burghs in Scotland functions of existing local authorities relating to poor relief, lunacy and mental deficiency, education, public health, and other matters; to amend the law relating to local government in Scotland; to grant relief from rates in the case of the lands and heritages in Scotland to which the Rating and Valuation (Apportionment) Act, 1928, applies; to discontinue grants from the Exchequer for certain purposes in Scotland, and to provide other grants in lieu thereof.

Both Bills were read a first time.

THE LOCAL GOVERNMENT BILL.*

Registration of Births, Deaths, and Marriages.

Part II. covers much the same ground as a Private Member's Bill of last session which passed the House of Commons but was not, through lack of time, proceeded with in the House of Lords. Clause 18 transfers to the councils of counties and county boroughs the functions of boards of guardians under the Registration Acts, but without, for the time being, disturbing the area of existing districts. Clause 19 (1) and (2) puts all new appointments on a salaried basis, and gives existing registration officers the right to become salaried. Subclause (3) gives the council the right to fix salaries and conditions of service, and provides that all fees shall be paid over by salaried officers to the councils. Clause 20 (1) gives power to the Minister, by order, to increase the fees by not more than 50 per cent. Subclause (2) requires officers remaining on a fee-earning basis to hand over to the local authority that part of the total fees received by them which is due to any increase in the scale made under Subclause (1). It will not be possible to disturb the existing system or areas before the Census of 1931 is taken, because the local arrangements for the Census will be in an advanced stage of preparation by the spring of next year. Clause 21 requires the councils of counties and county boroughs before April 1st, 1932, to prepare a scheme, for the Minister's approval, of the local establishment and organisation of registration personnel, which will otherwise remain, so far as relates to the performance of their registration duties, under the control of the Registrar-General in order that the necessary uniformity of practice may be maintained throughout the country. Subclause (2) provides that the clerk to the county council, and the town clerk of the county borough council, shall be the officer responsible for supervising the local administration. Subclause (4) secures to interested officers the right to have any representations they may make considered by the Minister before a scheme is approved. Subclause (5) gives the Registrar-General power, after consultation with the council, to make a scheme for the approval of the Minister if the council fail to make one. By an Act passed in 1858 the salary of the Registrar-General was fixed at £1200. Clause 22 meets the present situation by providing that the salary of the Registrar-General shall be such as may be determined by the Minister of Health with the approval of the Treasury.

Inconvenience is often caused to members of the public by the necessity (unless they have since removed from the district) of attending to register births and deaths at the office of the registrar for the subdistrict in which the event took place. In many cases some other registrar is more easily accessible. Any modification of the existing practice in connexion with the registration of deaths and stillbirths is complicated by the need for medical and other certificates and certain unavoidable formalities. Clause 23 (1) permits births to be registered by means of a declaration to a prescribed registrar who is not the registrar of the subdistrict in which the birth occurred. Subclause (5) gives the Minister power to make or approve regulations extending this modification of the present procedure to the registration of deaths and stillbirths. In the application of this part of the Bill to London: Clause 24 provides that the functions of boards of guardians shall be transferred to the Common Council of the City of London and to the councils of metropolitan boroughs and not to the London County Council.

Town Planning.

Part III. of the Bill deals with roads and town planning. At present county councils have no powers of taking any formal part in the preparation and administration of town planning schemes—a state of affairs which, even apart from the present proposals, has been shown by experience to be unsatisfactory. Clause 33 empowers county councils by agreement to act jointly with other local authorities in preparing or adopting town planning schemes and to be represented on joint committees that already exist for the purpose. Clause 34 empowers the Minister, after holding a local inquiry, unless all the authorities concerned are in agreement, to constitute a joint town planning committee by Order. Clause 35 (1) provides that a county council may be made the responsible authority for carrying out appropriate duties, more particularly in connexion with roads, under a town planning scheme; and Subclause (2) that, where under a scheme approved before the appointed day, a rural district council are the responsible authority as regards any functions relating to roads, streets, or building lines, the county council shall, as from the appointed day, be the responsible authority as regards those functions. Provision is, however, made enabling the Minister, by Order, to except from the transfer such functions as he thinks fit, or to provide for the exercise by the rural district council, subject to such conditions as may be imposed, of any of the functions so transferred. Under the existing law, councils of boroughs and urban districts with a population of over 20,000 are required to submit town planning schemes to the Minister by Jan. 1st, 1929. It is considered that an extension of the period for the submission of town planning schemes is requisite, and Clause 37 extends the period to Jan. 1st, 1939.

Miscellaneous Local Government Provisions.

The Government, in Part IV. of the Bill, following the unanimous recommendations of the Royal Commission on Local Government, have framed a comprehensive scheme for the adjustment and reorganisation of areas, and have made provision for other improvements. Clause 39 requires every county council, as soon as may be after the passing of the Act, after conference with representatives of county districts, to make a review of all districts wholly or partially within

* An account of the first part of the Bill, dealing with the poor-law, is given on p. 1048.

the county, and before April 1st, 1932, submit to the Minister such proposals as they think desirable for alterations of boundaries, unions of districts, the conversion of rural districts into urban or vice versa, or the formation of new districts. Provision is made for full publicity to be given to these proposals and for representations to be made to the Minister by interested parties. Proposals may include alterations of the boundaries of non-county boroughs and agreed alterations of the boundaries of county boroughs. The Minister may either make or refuse to make an Order giving full or partial effect to the proposals after consultation with the district councils, but a local inquiry must be held before a decision is given if a local authority objects to a proposal. Orders so made are to be laid before Parliament. Power is also given to the Minister, after consultation with the local authorities, to make proposals himself if the county council have failed to do so. Clause 40 provides for the making of subsequent periodical review by county councils after an interval of not less than ten years after the first review, and of consequent Orders by the Minister. In case, however, of objection by a borough to any proposal affecting it, the Order will be provisional only until confirmed by Parliament. Clause 44 (1) provides that a rural district council may contribute as part of their general expenses towards the defrayment of "special expenses"—i.e., expenses for water, sewerage, &c., which would at present usually be levied on a parish or combination of parishes and not on the district as a whole. Clause 45 (1) empowers county councils to contribute towards expenditure incurred by a county district in connexion with sewerage or water-supply, and Subclause (2) provides that a district council may by agreement with the county council relinquish in favour of the latter any of its public health functions. Under Subclause (3), in case of default on the part of a county district to perform a public health function, the Minister is given power, after holding a local inquiry, by Order to transfer the function to the county council.

Under the Public Health Act, 1875, the Minister has power to combine two or more county districts for the purpose of appointing a single medical officer of health. This power is used to make the employment of whole-time officers possible. Another way of achieving this object is the appointment of an officer who is at the same time an assistant county medical officer. But on March 31st, 1927, out of 1686 county district councils, only 505 employed a medical officer of health who gave his whole time to public duties; the remaining 1181 employed private practitioners. For all classes of local authorities the proportion of whole-time appointments of medical officers has only advanced from about a quarter to something over a third in the last half century. The Royal Commission were impressed with the need for quicker progress, and Clause 46 provides that county councils shall, in consultation with their county districts, formulate arrangements, by combination of districts for the purpose or otherwise, to secure that every medical officer of health subsequently appointed for a district shall be debarred from private practice; in case of default the Minister may formulate the necessary arrangements himself. Provision is made for waiving in exceptional cases the condition that whole-time service shall be given. Clause 47 makes statutory the power which the Minister has hitherto exercised of regulating the standard of qualifications for medical officers of health and health visitors.

The Royal Commission recommended that the local authorities who administer the school medical service should be empowered to represent to the Minister that they should also administer maternity and child welfare work within the areas for which they are local education authorities, in order that there may be continuity in the supervision of the health of children before and after reaching school age. At present there are 159 maternity and child welfare authorities who are not school medical authorities, and 26 school medical authorities (outside London) who are not maternity and child welfare authorities. Clause 48 provides that where in any district any service under the Maternity and Child Welfare Act, 1918, is being carried on by a council which is not the local education authority for the district, the Minister may, on representations being made to him by the local education authority, withdraw his sanction to the arrangement and provide for the transfer of the maternity and child welfare service to the local education authority.

It is plainly desirable that notifications of births should be sent in every case to the local maternity and child welfare authority. At present the latter may obtain an Order from the Minister to secure this, but a number of authorities have neglected to make the necessary application. Clause 49 therefore empowers the Minister to make the necessary Order even if the council concerned have made no application for it.

The responsibility for supervising midwives at present rests, with a few exceptions, on the councils of counties and county boroughs. But those councils of county districts which have maternity and child welfare schemes and have established antenatal clinics and maternity homes, are deeply interested in the supervision of midwives, and are desirous that the work of the midwives should be supervised by them and not by the county council. Clause 50 permits the council of a county district which is a maternity and child welfare authority and employs a medical officer of health who is not in private practice, to apply to the Minister for an Order transferring to them the supervision of midwives, if, in his opinion, the circumstances justify it. Under Subclause (2) an Order may be revoked by the Minister at any time.

At present both county councils and councils of county districts may provide hospitals for the treatment of infectious diseases, but in some parts of the country there is a serious deficiency of accommodation of this kind. Under Part I. of the Bill practically the whole of the public institutions in a county will pass into the control of the county council, and some of the existing institutions may be suitable for use as infectious diseases hospitals. As the provision of hospitals for infectious diseases is, and will remain, a function of the councils of county districts also, the county council should be able to foster coöperation between the authorities owning the hospitals and also to secure that adequate accommodation is available for this purpose. This provision will round off the power given to county councils under Part I. to secure the proper classification of institutional treatment with a view to the efficient use and development of the institutions. Clause 51 (1) lays upon every county council the obligation of making a survey of the hospital provision for infectious diseases throughout the county. Subclause (2): When the survey is complete, the council, in consultation if necessary with the council of any adjoining county borough, must prepare a scheme for providing adequate hospital accommodation for infectious diseases. Subclause (3): The scheme may provide for the joint use of institutions owned by individual authorities, and for the provision of additional accommodation by the county council. Subclause (4): Where the council of a county district fails to provide the accommodation required from them under the scheme the Minister may transfer the functions of the councils of the local authorities under the scheme to the county council, to be exercised by them at the cost of the local authority. Subclauses (5) and (6): Schemes will not be effective until approved by the Minister, and in case of default the Minister may himself make a scheme. The clause contains the usual provisions for securing consultation with the interested local authorities at all stages.

Clause 52 enables the Minister, on application from the London County Council or of any association or committee which is in his opinion representative of the metropolitan borough councils, to provide by Order, subject to certain conditions as to consultation, for the transfer to all the metropolitan borough councils of any functions exerciseable by the London County Council (other than functions transferred to them under Part I. of the Bill) or for the exercise of any such functions by the metropolitan borough councils as agents for the London County Council. The clause is included as the result of representations on the subject from both the London County Council and the Metropolitan Boroughs Standing Joint Committee. An Order may extend to the Common Council of the City of London, if they consent.

Parts V. and VI. of the Bill deal with rating and valuation, and Exchequer grants and other financial provisions.

Property, Liabilities, and Officers.

Part VII. of the Bill deals with property, liability, and officers. Clause 93 with the sixth schedule provides for the transfer of the property and liabilities of boards of guardians to the counties and county boroughs which are their successors in function. Provision is made for adjustments in respect of property and liabilities, where the councils concerned so desire, if the present poor-law area is not wholly within a single county or county borough. Provision is also made for joint user of institutions. Clause 99 provides for the transfer of poor-law officers to the appropriate county or county borough council. Where they are attached to a particular institution or district, they will pass into the service of the council to which the institution or district is transferred. In other cases, if the union is divided up between one or more councils, the councils must agree, or failing agreement, the Minister must determine, to which council any officer is to be transferred. Clause 101 safeguards the existing tenure of transferred officers and provides that they shall receive not less remuneration while performing similar duties. Clause 102 safeguards the existing tenure of registration officers, and provides that for superannuation purposes they shall be deemed to be officers of the council to which the registration functions relating to their district or subdistrict are transferred under Part II. of the Bill. Clause 103 and Schedule VIII. provide for the payment of compensation to officers of authorities, from whom functions

are transferred, who thereby suffer any direct pecuniary loss. Clause 104, Subclause (1), provides that where the new authority have adopted the Local Government and other Officers' Superannuation Act of 1922, that Act shall (with necessary modifications) apply to transferred poor-law officers instead of the Act of 1896. Subclause (2) provides that, where the new authority have some other superannuation scheme in force themselves, they are to submit for the Minister's approval a scheme for substituting it for the provisions of the Act of 1896 in the case of transferred officers; when his approval has been given, the Act of 1896 shall cease to apply to them. Subclause (3) provides that where the new authority have at present no superannuation scheme, the Act of 1896 shall continue to apply to transferred poor-law officers. Subclause (4) deals with the case of poor-law officers who may after transfer become officers to whom the Asylum Officers Superannuation Act, 1909, applies. Subclause (5) provides that poor-law teachers who would, if they were serving in an elementary school, be covered by the Teachers' Superannuation Act, 1925, shall on transfer come under that Act instead of the Act of 1896.

General.

The transfer of poor-law functions and the abolition of existing poor-law areas is certain to give rise to difficulties in exceptional cases, which cannot be fully covered by the Bill. Clause 111 (1) gives power to the Minister to remove difficulties by Order. Under Subclause (2) every such Order is to be laid before Parliament, and by Subclause (3) of Clause 109 is to become void, if an Address against it is presented to His Majesty by either House within the next subsequent 21 days when that House has sat after the Order is laid. Under the proviso to Subclause (1) the power to make such Orders is to determine at the end of 1930.

PREVENTION OF MOTOR ACCIDENTS.

The Bill for the better regulation of road vehicles (which has been introduced into the House of Lords by Viscount Cecil of Chelwood) aims at diminishing the number of road accidents due to incompetent driving. The Bill requires all drivers to take out a licence after examination into their skill and physical fitness, and the Minister of Transport will be empowered to make general regulations to carry this provision into effect, and to make regulations requiring the production by the applicant for a licence of evidence, by a doctor's certificate or otherwise, that he is fit to drive a mechanically propelled vehicle. All motor vehicles will require to have a mechanical check on their speed, and third party insurance is to be made compulsory.

HOUSE OF COMMONS.

THURSDAY, NOV. 8TH.

Street Noises in Large Cities.

Mr. ERSKINE asked the Home Secretary whether he was taking steps to mitigate the nuisance of unnecessary street noises in London and other large cities; and, if so, the nature of his proposals.—Colonel W. ASHLEY (Minister of Transport) replied: I have convened a conference of all interests concerned to advise me what steps they consider could best be taken to mitigate unnecessary noise made by mechanically propelled vehicles. I hope to be in possession of their views at an early date.

Colonel WOODCOCK asked the Home Secretary if he was aware that the noise of motor-cycles without adequate silencers had in no way abated throughout the country; whether he could issue more stringent instructions to the police to deal with this great public nuisance; and, if the engines of motor-cycles did not conform to the police regulations respecting silencers, proceedings would be taken against the owners.—Sir W. JOYNSON-HICKS replied: I hope the action which has been taken has not been wholly without effect. The police will certainly continue to take proceedings and, I may add, the whole question of traffic noise is under consideration by a conference which has been convened by the Minister of Transport.

Colonel WOODCOCK: What special steps have been taken during the recess?

Sir W. JOYNSON-HICKS: We have prosecuted 10,000 cases from Jan. 1st of this year, so that the police really are carrying out their duties.

Mr. HARRIS: How far have the manufacturers been brought into conference?

Sir W. JOYNSON-HICKS: I am in constant conference with the manufacturers of motor-cycles, and am constantly pressing them to improve the silencers on their new motor-cycles.

Bogus Charitable Collections.

Colonel WOODCOCK asked the Home Secretary if his attention had been called to several recent instances of bogus charitable collections; and whether he proposed to take steps to carry into effect the recommendations of the departmental committee which he set up, and establish some system of control over charity collections.—Sir W. JOYNSON-HICKS replied: The only recent case which has come to my notice is one in which a collector was convicted by a Scottish court. It would appear that the ordinary criminal law was adequate to deal with that case. As I have already stated, I am preparing a Bill to carry out the recommendations of the recent Inter-Departmental Committee.

Colonel WOODCOCK: Is the Home Secretary aware that these bogus collections and charities are very detrimental to the really good causes for which collections are genuine; and is he going to take steps to bring in legislation this session so that the recommendations of the Committee may be carried into effect?

Sir W. JOYNSON-HICKS: Generally speaking, the hon. Member has correctly stated the position. I am preparing a Bill, and the Prime Minister and the Parliamentary Secretary to the Treasury will say whether there is any possibility of it being carried this session.

Institutional Care of Mental Defectives.

Mr. ROBERT MORRISON asked the Minister of Health whether his attention had been called to the statement contained in the annual report of the Board of Control that there were 20,000 mental defectives for whom institutional care was required but was unobtainable; and what action he proposed to take.—Mr. CHAMBERLAIN replied: My attention has been called to this statement. Many local authorities are making further provision, and others are being urged to take action, in so far as is practicable in the present financial position. I anticipate that one of the results of the scheme of local government reform will be that local authorities will have spare accommodation available for this and other services of public health.

Institutional Poor-law Relief.

Sir WALTER DE FRECE asked the Minister of Health the average daily number of inmates in general poor-law institutions in England and Wales, the average weekly cost per inmate, and the total expenditure in connexion with those institutions for 1914 and each of the last ten years.—Mr. CHAMBERLAIN replied: The following statement contains such of the desired information as is available. It refers to general poor-law institutions in England and Wales administered under the Poor-law Institutions Order, 1913, including a few specialised institutions for which separate accounts are not kept.

Year ended March 31st.	Average daily number of inmates.	Average weekly cost per inmate of "in-maintenance."*	Total expenditure in connexion with general poor-law institutions.
		s. d.	£
1914 } 1918 } ..	Particulars comparable with those for later years are not available.		
1919.. ..	110,607	10 5¼	5,769,335
1920.. ..	109,392	12 3¼	7,251,563
1921.. ..	117,027	14 2¼	9,388,891
1922.. ..	127,467	12 0¾	Not available.
1923.. ..	131,862	9 9¼	7,889,037
1924.. ..	132,967	9 6½	7,752,006
1925.. ..	131,899	9 10½	8,140,699
1926.. ..	134,418	9 11¾	8,469,749
1927.. ..	139,261	10 3¼	8,783,769

* In-maintenance includes all the expenses incurred in and about the maintenance and treatment of persons in receipt of relief in general poor-law institutions—e.g., the cost of food, clothing, medicine, necessary expenses incurred in warming, cleansing, and lighting the institutions, and otherwise keeping them fit for daily use. It excludes the cost of buildings and repairs thereto, and furniture, and the salaries and other remuneration, rations, and superannuation allowances of officers and servants.

Coöperation Between Voluntary and Poor-law Hospitals.

Dr. LITTLE asked the Minister of Health what arrangements, if any, had been made to secure the coöperation of the voluntary hospitals and the hospitals now under poor-law administration, as contemplated by the Bill for the reorganisation of local government named in the King's speech as the principal measure of this session; if any estimate had been made of the probable cost of the provision at these municipal hospitals of medical and nursing services on the same scale as now obtained at the voluntary hospitals, where the medical services were mostly unpaid; and if he could furnish any information as to the measure of increase in the rates likely to follow upon the competition of the municipal hospitals with the voluntary hospitals in the event of no coöperation being achieved between these two classes of ohspitals.—Mr. CHAMBERLAIN replied: The general problem alluded to by the hon. Member in the first part of the question has been actively discussed in many quarters for a very considerable

time. Definite local arrangements on the new basis cannot be entered into until the Local Government Bill has become law; and it is impossible in the meantime either to accept the assumptions which appear to underlie the remainder of the question or to base any estimates upon them.

Cost of Medical Inspection of Casuals.

Mr. CHARLES EDWARDS asked the Minister of Health whether he had received communications from boards of guardians requesting him to pay the cost of the inspection of casuals for the detection of small-pox from national funds; and if he would take steps to enable his department to do this.—Mr. CHAMBERLAIN replied: The answer to the first part of the question is in the affirmative. There are no funds at my disposal out of which such a payment could be made.

Medical Certification and Health Insurance.

Sir WALTER DE FRECE asked the Minister of Health whether he had any evidence that the increase in the expenditure on sickness and disablement benefit was in any way attributable to the administration of certain friendly societies and/or the laxity of doctors in the issuing of certificates: and, if so, what remedial action he was taking.—Mr. CHAMBERLAIN replied: I can best answer my hon. friend's question by saying that in endeavouring to ascertain how far the recent abnormal increase in expenditure on sickness and disablement benefits is attributable to causes which can and should be removed, I am receiving the full coöperation of approved societies of all types in inquiries for the purpose of securing that their administrative methods shall be fully efficient; and of the Insurance Acts Committee of the British Medical Association, who recently submitted to a conference of local medical and panel committees a number of detailed proposals, to which the conference agreed with certain amendments, for improving the procedure under which insurance practitioners at present carry out their duties with respect to medical certification.

Aged Persons and Health Insurance.

Mr. GROVES asked the Minister of Health whether he was aware of the dissatisfaction felt and expressed by insured persons who had contributed to the health insurance fund for many years and find themselves at the age of 70 precluded from further participation in the benefits of the fund; and whether he would take steps to enable them to continue to participate, especially in the case of those not eligible for old age pensions.—Mr. CHAMBERLAIN replied: I am not aware that there is any general dissatisfaction on the part of insured persons on the subject referred to by the hon. Member. An insured person ceases to be entitled to sickness or disablement benefit on attaining the age of 65, at which old age pensions now become payable, but notwithstanding the fact that thereafter he is under no liability to pay any further contributions either for health insurance or pensions, he remains entitled for the rest of his life to all the other benefits under the Health Insurance scheme—that is to say, to medical benefit, maternity benefit, and any additional benefits provided by his approved society in the form of treatment, such as dental, ophthalmic, or hospital benefit. I have no power to authorise the continued payment of sickness or disablement benefit after the age of 65.

National Insurance Drug Fund.

Dr. LITTLE asked the Minister of Health if, when making the agreement with the Retail Pharmacists Union relating to the National Insurance Drug Fund, described in the annual report of the Ministry of Health, 1927–28, the British Medical Association was consulted; if the approval of that agreement was obtained; and if, in view of the unanimous condemnation of the agreement as being against public policy recorded by two full sessions 1927 and 1928 of the annual conference of panel committees, he would rescind that agreement.—Mr. CHAMBERLAIN replied: Before the agreement with the Retail Pharmacists Union was actually concluded the Insurance Acts Committee of the British Medical Association were made acquainted with its terms by letter, and subsequently a conference took place at the Ministry when various criticisms and suggestions were fully discussed. The approval of the British Medical Association to the agreement as a whole was not invited, and has not therefore been obtained. At the conference of panel committees in 1927 a considerable difference of opinion was manifested although the resolution mentioned in the question was ultimately passed and reaffirmed without discussion in 1928. I am not prepared to rescind the agreement.

MONDAY, NOV. 12TH.

Medical Test for Metal Grinders.

Mr. WILLIAM THORNE asked the Home Secretary the number of metal grinders who had been discharged in consequence of failing to pass a medical test in accordance with the Statutory Rules and Orders, 1927, No. 380, in respect to the metal-grinding industries (silicosis) scheme, and had not been able to qualify for workmen's compensation.—Sir W. JOYNSON-HICKS replied: No medical test for employment is imposed by this scheme. I understand that workmen employed by certain firms in these industries have been required by their employers for the purposes of insurance to pass a medical examination, and that some of them who failed to pass have been discharged, but I have no information as to the number affected. I may add that a workman employed at or after the commencement of the scheme has a right to claim compensation under the scheme for total disablement after he has left the employment, provided he has been employed in the dusty processes within the previous three years.

Compensation to Owners of House Property.

Mr. BENNETT asked the Minister of Health if it was the intention of his department to introduce legislation in favour of the grant of reasonable compensation to owners of habitable house property which might be included in slum clearance schemes.—Mr. CHAMBERLAIN replied: It is the intention of the Government to introduce, at the earliest practicable moment, legislation dealing with slum areas, which will provide for an amendment in certain respects of Section 46 of the Housing Act, 1925.

Protection of Food from Contamination.

Mr. COUPER asked the Minister of Health what precautions were taken to protect food from contamination when displayed for sale; whether he was satisfied that such precautions were adequate; and what further legislation, if any, was contemplated.—Sir KINGSLEY WOOD replied: The Public Health (Meat) Regulations, and the Public Health Act, 1925, contain provisions for preventing risk of contamination of food offered for sale. No doubt the precautions taken by different traders in compliance with those requirements vary considerably, but on the information before him my right hon. friend does not think that there is any need for further legislation to extend the powers of control already possessed by local authorities.

Importation of Infected Sheep Carcasses.

Mr. WILLIAM THORNE asked the Minister of Health if he was aware that, in consequence of thousands of carcasses of mutton from Patagonian Chili being seized and condemned by the inspection authorities in the City of London on account of the disease known as caseous lymphadenitis, the authorities had placed an embargo on all wharves, stores, and markets within their area, and refused to pass for sale any sheep until the glands of the legs and shoulders had been incised and the carcass found immune; that the Port of London sanitary authority refused to adop[illegible] whether any action was being taken [illegible] disease at the ports of Avonmouth, [illegible] Manchester; and what steps, if any, he proposed to take to prevent the flooding of the country with these infected sheep.—Sir KINGSLEY WOOD replied: Yes, Sir. I understand that it is the practice in the City of London to examine all sheep's carcasses for caseous lymphadenitis before they are distributed to retailers. The Port of London Sanitary Authority have recently decided to examine for this disease a percentage of the carcasses arriving at the docks, and to release the remainder to cold stores in the London area on condition that they are not removed therefrom without the permission of the local medical officer of health. My right hon. friend is making inquiries as to the practice at the ports of Avonmouth, Cardiff, Liverpool, and Manchester, and he hopes that it will be possible to arrange for uniform action to be taken at all ports for preventing the distribution of meat infected with this disease.

QUEEN ALEXANDRA'S HOSPITAL FOR OFFICERS.—Lord Melchett presided at the eighth annual reunion dinner held at the Hotel Cecil on Nov. 8th. He paid a tribute to the good work done at the hospital by all the members of the staff, and in particular by Mr. Herbert Paterson, who for the whole period of the war acted as honorary surgeon in charge. Lord Waring, who equipped and maintained an annexe to the hospital, was present at the dinner.

DEPUTATIONS ON NOISE.—Mr. Neville Chamberlain, Minister of Health, has consented to receive on Dec. 4th a deputation from the medical council of the People's League of Health on the effect of noise on the health of the community [illegible] last the League [illegible] to the laid before the Minister a [illegible] noises need for the control and [illegible] in the streets. A deputation from the British Medical Association on the same subject will be received by Mr. Chamberlain at the same time, and will emphasise certain of the points which the Association has recently placed before him in a memorandum.

THE

Story

OF

NICHOLAS CULPEPPER:

ASTROLOGER-PHYSICIAN.

Told in Responding to the Toast of "The Guests" at the Annual Dinner of the Royal Society of Medicine

BY RUDYARD KIPLING.

FELLOW-GUESTS,—I don't know how it is with you, but, when a medical man approaches me in the language of compliment, I am filled with an uneasy suspicion that somebody's tobacco is going to be rationed. That possibility, however, is behind us for this evening, so we can the better appreciate Colonel MacArthur's flattering diagnosis of our several virtues and merits. Some of us must have all of the symptoms indicated. I have one. I am a story-teller.

LORD DAWSON, members of the Royal Society of Medicine, gentlemen, and ladies, will you lend me your patience while I tell you a perfectly true story?

Nearly 300 years ago there was an astrologer-physician called Nicholas Culpepper, practising in Spitalfields. And it happened that a friend's maid-servant fell sick with what the local practitioner diagnosed as plague. Culpepper was called in as a second opinion. When he arrived the family were packing up the beds, preparatory to going away and leaving the girl to die. He took charge. There was no silly nonsense about looking for the characteristic plague tongue. He only asked at what hour the young woman had taken to her bed. That gave him, as I need not tell you, "the hour of the decumbiture." He then erected a horoscope, and "inquired of the face of the Heavens how the malady might prove." The face of the heavens indicated it was not plague but just small-pox, which our ancestors treated almost as lightly as we do. And small-pox it turned out to be. So the family came back with their bedding, and lived happily ever after; the girl recovered; and Culpepper said what he thought of his misguided fellow-practitioner. Among other things, he called him "a man of forlorn fortunes with sore eyes."

Preposterous as all this was, you must remember that Culpepper justified his practice by the theory that "this creation, though composed of contraries, is one united body, of which man is the epitome, and that he, therefore, who would understand the mystery of healing must look as high as the stars."

That was a distorted shadow of the ancient idea that the universe is one in ultimate essence—which essence is sustained and embraced and inter-penetrated by a creative motion or inner heat—the pneuma of certain Greek physicians, who practised 500 years before St. Paul preached at Athens. It was a noble belief; but it did not prevent Dr. Culpepper from using a pharmacopœia and thera-peutics that would have made a West African witch doctor jealous. And when he came across anything that he did not understand, or that Aristotle had not provided for, he put it down to "influences" or "emanations"—same as you do a common cold.

But if he could return to earth to-day and see how things have progressed in the mystery of healing I fancy he would be quite at ease in your Zion. He believed in the transmutation of metals. He could be shown that in full blast at a Royal Society soirée—with emanations. He would find that the essential unity of creation is admitted as far forth as we have plumbed infinity; and that man, Culpepper's epitome of all, is in himself a universe of universes, each universe ordered—negatively and positively, by sympathy and antipathy—on the same lines as hold the stars in their courses.

Consequently, he would not be astonished to see men snatch out of the air an influence—an inner heat or pneuma—of which they know no more than that it visibly warms, lights, and works for them, and, invisibly, transmits their speech and vision to one side of the world on the instant that they themselves speak or look from the other. And the news that unknown influences from out of the skies lash and tear through all matter everywhere at all times would be received by him with perfect calm.

Being an astrologer, he would, of course, go to Greenwich Observatory, to learn more about those influences. There he would be given monographs on terrestrial magnetism—its daily and seasonal tides the world over, magnetic storms, sunspots, auroras, and so forth, but all discussed without any relation to the severity or incidence of prevalent epidemics and diseases. From Greenwich he would certainly push on to the B.B.C., who would tell him that there are unknown heavenly influences which prevent millions of bold youths and blushing maidens from hearing the music they would dance to—influences which at times cause the spoken word to die out under the stars as the note of a rubbed finger-bowl dies when the hand is lifted.

Presently—for he was always stronger on theory than research—he would fetch up among the labora-tories where, if he was as lucky as I was this summer, he would be shown marvellous films of infected tissue being subjected to the influence of an influence called radium. Then, I fancy, the fun would begin. Up to that point, he would find the main axiom which he had quoted three centuries before accepted, proven, and in use; the influence, the inner breath, the pneuma—not only exceeding all bounds of wonder and belief in its proper manifestations, but, under the name of electricity, piping and singing in the market-place on a commercial basis.

So, as with his small-pox case, his first question after he had seen the films would be: "What was the aspect of the heavens at the time these phenomena occurred?" He would take it for granted that, with the whole universe alight to signal some tremendous secret to mankind, men would naturally look as high as the stars. And what answer would he get? When I asked a similar question of a man of science lately he said: "You'd better see a doctor." I told him that, with any luck, I expected to see ever so many of them before long. That expectation having been fulfilled to-night, I want to ask you some questions.

Isn't it likely that the multitude and significance of the revelations heaped upon us within the past few years have made men in self-defence specialise more and more narrowly? Haven't we been driven headlong to abandon our conceptions of life, motion, and matter? And isn't it human that in that upheaval men may have carried off each his own cherished prepossession and camped beside it—just as refugees do after an earthquake?

Is it then arguable that we may still mistake secondary causes for primary ones, and attribute to instant and visible agents of disease unconditioned activities which, in truth, depend on some breath drawn from the motion of the universe—of the entire universe, revolving as one body (or dynamo if you choose) through infinite but occupied space? The idea is wildly absurd? Quite true. But what does that matter if any fraction of any idea helps towards mastering even one combination in the great time-locks of Life and Death?

Suppose, then, at some future time when the bacteriologist and the physicist are for the moment at a standstill, wouldn't it be interesting if they took their problem to the astronomer, and—in modern scientific language, of course—put to him Nicholas Culpepper's curious question: "What was the aspect of the heavens when such-and-such phenomena were observed?"

palliative operations and almost always worth doing. I have had patients living useful lives three to five years after the operation. The least satisfactory is the operation of tracheotomy for laryngeal cancer, though it is hard to refuse it to a patient dying from asphyxia.

REPUTED CURES.

Finally, what are we to do when a patient who has heard of some reputed cancer cure wishes to try it and asks our sanction or even our coöperation? I do not think we should resent this attitude on the part of a patient; it is only human nature to follow a will-o'-the-wisp when all seems dark ahead; if the treatment proposed is not a secret remedy, and we can be sure that it will not do actual harm, I see no reason why we should not humour the patient and loyally do our best to help him; it will, at the least, occupy his mind. If, however, the remedy or treatment proposed is harmful or a secret, as to the nature of which we are told nothing, I think we must refuse our sanction and, if the patient persists, refuse to take any responsibility and retire from the case.

Never tell a patient suffering from cancer or his friends that there is nothing to be done; so long as life lasts there is help to be given, and there are few forms of disease where the doctor can earn more gratitude than he can by his management of a case of inoperable cancer. In some cases where it is obvious that death would be the greatest mercy possible, it may be well for the practitioner to remember the words of the poet Clough:—

> "Thou shalt not kill; but need'st not strive
> Officiously to keep alive."

A CLINICAL AND BIOCHEMICAL

Study

OF

ALLERGY.

BY H. W. BARBER, M.B. CAMB., F.R.C.P. LOND.,
PHYSICIAN IN CHARGE OF THE SKIN DEPARTMENT, GUY'S HOSPITAL;
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II.*

THE URINE.

A study of the urine has proved of very great interest and importance in allergic states, and it is no exaggeration to say that we can deduce from a given specimen taken from a person with allergic symptoms whether it was passed at the onset or during the paroxysm or in the period following it, and can also predict the urinary findings from the condition of the patient at a given time. There are two phenomena which we believe to be almost if not quite constant in persons with allergic symptoms at certain times during the periods of active manifestation—viz., the ether reaction discovered by one of us (G. H. O.), and the deposition of urates or uric acid in the urine on cooling. Before considering the urinary findings in detail it is advisable to summarise what we have found to occur in the cycle of events that takes place in all acute allergic states—e.g., an attack of asthma, urticaria, angeioneurotic œdema, or migraine, and in the paroxysms of itching that occur periodically in prurigo and infantile eczema.

Cycle of Events in Allergic Conditions.

In the period just preceding and during the paroxysms we find:—

Blood.—1. The amino-acid content rises. 2. The uric acid and creatinine are apparently increased. 3. The chloride content of the whole blood falls.

Urine.—1. Free acidity rises. 2. Urates are often deposited when the urine cools. 3. Diminished water excretion, so that the specific gravity is usually high. 4. Retention of chlorides. 5. Ether reaction strongly positive. 6. Ammonia excretion rises and the ratio of free acid to ammonia-combined acid is altered. 7. Excretion of amino-acid, creatinine, and uric acid begins to rise.

In the period following the subsidence of the paroxysm we find:—

Blood.—1. The amino-acid content falls. 2. The uric acid and creatinine diminish. 3. The chloride content of the whole blood rises.

Urine.—1. The free acidity rapidly and progressively falls, and the urine tends to become neutral and finally alkaline, sometimes strongly so. 2. Increased excretion of water, so that the volume is raised and the specific gravity falls (post-paroxysmal diuresis). 3. The excretion of chlorides is increased. 4. The ether reaction diminishes and may entirely disappear. 5. The excretion of ammonia begins to fall, but lags, so to speak, behind the diminishing excretion of acid, so that the ratio of free acid to ammonia is still further altered. 6. Excretion of amino-acid, creatinine, and uric acid gradually falls.

For comparison the urinary findings in a case of true anaphylactic shock are submitted. (Table IV.)

CASE 10, a patient with ulcerative colitis, was one of simple anaphylactic shock which developed as the anti-dysenteric serum was actually being injected into a vein. The patient became collapsed and unconscious and there was incontinence of urine and fæces. Adrenalin was injected and consciousness rapidly returned.

The figures should be compared with those submitted in cases of allergic manifestations, such as asthma and urticaria,

* Part I. appeared last week.

TABLE IV. (CASE 10).—*Anaphylactic Shock following the Administration of Antidysenteric Serum.*
Shock with involuntary micturition commenced 3.30 P.M., July 19th. Complete anuria till 10 P.M.

Date.	Time.	Free acid.*	Ammonia.	Ratio of free acid to A.-c. A.	Chloride.	Phosphate.	Urea.	Creatinine.	Albumin.	Urates deposit.	Ether reactions.	Vol.	Vol. per hour.
			mg.*		mg.*	g.*	g.*	mg.*				c.cm.	c.cm.
July 19 ..	10 P.M.	34	129·2	1 : 2·2	200	0·15	3·0	286	+ +	+ +	+ + + +	30	5·0
	Midnight	36	122·4	1 : 2·0	220	—	2·9	286	+ +	—	+ + +	15	7·5
July 20 ..	2 A.M.	54	122·4	1 : 1·3	180	0·275	2·7	250	+	—	+ + +	75	37·5
	5 A.M.	82	136·0	1 : 1·0	130	0·485	2·7	222	Nil	—	+ + +	150	50·0
	8 A.M.	78	136·0	1 : 1·0	100	0·475	2·9	222	,,	—	+ + +	120	40·0
Total ..	.. ..	281·8	517·0	1 : 1	543·0	1·548	10·75	909				390	
July 20 ..	7 P.M.	6	30·6	1 : 3·0	60	0·09	1·3	77	Nil	—	+	180	—
	8 P.M.	4	27·0	1 : 4·0	50	0·075	1·2	70	,,	—	+	180	180·0
	10 P.M.	4	27·0	1 : 4·0	70	0·07	1·0	70	,,	—	+	210	105·0
	11 P.M.	2	23·8	1 : 3·5	65	0·055	0·088	58	,,	—	+	150	150·0
July 21 ..	6 A.M.	34	102·0	1 : 1·8	120	—	2·0	286	,,	—	+ +	45	6·4
	8 A.M.	22	78·2	1 : 2·0	130	0·14	1·9	166	,,	—	+	150	75·0
Total ..	.. ..	77·7	359·0	1 : 2·7	636·0	0·726	11·72	946				915	

* Per 100 c.cm. A.-c. A. = Ammonia-combined acid.

and reference should be made to the tabulated cycle of events that have been found to occur during and after the allergic paroxysm.

It will be noted that :—

1. The first specimen of urine collected after the shock deposited urates.

2. The first three specimens of urine contained albumin; albuminuria has been shown by Freeman to occur in hay-fever subjects after intravenous or subcutaneous injections of pollen extract, and by Rackemann, Longcope, and Peters in serum sickness.

3. The ether reaction was very strongly positive in all the urines of the first 12 hours following the shock and diminished gradually. (It had disappeared by the end of the third day.)

4. During the first 12 hours the free acidity rose very markedly; it then fell, but the ammonia excretion remained relatively high, thus disturbing the normal acid-ammonia ratio. The total free acidity for the first period of 12 hours was 281·8; that for the second period only 77·7.

5. The chloride excretion was low throughout, particularly on the evening of the second day. (It began to rise again on the evening of the third day.)

6. The creatinine excretion was high.

7. After an initial period of anuria the urinary excretion was very small, a highly acid, concentrated urine being passed; by the evening of the second day the post-paroxysmal diuresis had become established, and a large quantity of dilute urine of low acidity was excreted.

The Precipitation of Urates.

The precipitation of urates in the urine on cooling is a phenomenon that has not in our opinion received sufficient attention from clinicians. It is usually taught that such precipitation, when the urine cools, depends on (1) the concentration, (2) the acidity. As a matter of fact these are of relatively minor importance. We have seen a heavy deposit of urates in a urine with quite low free acidity and a specific gravity of 1012. As has been shown by Lichtwitz[41] and others, the solubility of uric acid and its salts depend upon the colloid state of the urine. The concentration is of subsidiary importance, for precipitation may occur with quite normal amounts, while abnormal amounts may remain in solution. Other conditions being the same, a sediment therefore occurs more readily in concentrated urine. The hydrogen-ion concentration is of significance merely in that precipitation only occurs in acid urines. *The dominant factor for the solubility is the state of the urine colloids* (Rosenbloom).

Since the precipitation of urates does not depend on the uric acid itself, such precipitation does not in any way indicate the "uric acid diathesis." Brugsch and Schittenhelm[42] have pointed out that whereas true gout is extremely rare in childhood, uric acid stone is most frequent, and the majority of cases of urate stone diathesis occur without true gout.

Now, although the precipitation of urates may be found in the urines of apparently normal healthy people, it is, in our experience, comparatively rare, and we believe that it is an indication, even in persons organically sound, at any rate of a temporary functional metabolic disturbance. One of us (H. W. B.) makes a rule to examine an early morning specimen of urine from nearly every patient he sees in private practice, and he finds that urates are more commonly deposited in the night or early morning urine than at other times; nevertheless, except in patients with allergic symptoms, it is rare to see a specimen with uratic sediment. Even in patients with acute seborrhœic manifestations, in whom the urine is usually excessively acid, such a sediment is very uncommon. On the other hand, it is seen in patients with cirrhosis of the liver, heart failure with hepatic degeneration, and in acute infections such as pneumonia. In allergic diseases it is so frequent as to be almost constant at some period in the 24 hours, at least during the phase of active manifestations. In infantile eczema, urticaria, and the asthma-prurigo syndrome, for example, a reddish sediment is almost invariably noticed in the urine on cooling from time to time. It seems, therefore, that in allergic diseases there is an alteration in the colloidal state of the urine which predisposes to the deposition of urates.

The Ether Reaction.

This reaction was first observed by one of us (G. H. O.) in cases of cardiac failure with œdema. The test is performed as follows :—

To a few c.cm. of urine are added first a little of a 25 per cent. solution of sulphuric acid and then sufficient ether to form a layer above the urine about half an inch in depth. The mixture is then thoroughly shaken with the thumb over the mouth of the test-tube and allowed to stand. The layer of ether becomes frothy, but, if the reaction be positive, the froth in its lower part becomes viscous and opaque, like melted wax, after ten minutes or so. In strongly positive tests the tube of urine can then be inverted without spilling. The degree of positiveness is measured by the depth and density of the waxy scum beneath the superficial froth, and we would here emphasise that the test is one of degree only, because a slight reaction—i.e., the formation of a narrow band of opaque scum—is frequently found in apparently normal people. For this reason we do not wish to exaggerate the importance of the reaction; nevertheless it is one of great interest and deserves further study.

As far as our observations go, the reaction is always strongly positive during the acute phase of allergic manifestations but may disappear during the period of quiescence. We have, for example, found it very marked after anaphylactic shock and during the acute eruptive stages of urticaria and urticaria papulosa, though sometimes practically absent between the outbreaks. In migraine—and Dr. Moreland McCrea has confirmed this—it is positive during the attacks but may be negative at other times. In infantile eczema and the asthma-prurigo syndrome it may be well marked in practically every specimen of urine examined, but it is always most intense during the paroxysms of itching. It was strongly positive in the case of anaphylactic shock referred to above. We have also found it in hepatic disease, in acute febrile infections such as pneumonia, and in certain cases of active tuberculosis, and we have also seen it strongly positive in some cases of acute toxic eruptions from food poisoning and in generalised eczema due apparently to sensitisation to external irritants. It seems likely that there is a connexion between this reaction and the deposition of urates, both being probably dependent on an alteration in the colloid state of the urine.

If urine which gives a strong ether reaction is treated with a large excess of alcohol, a precipitate is obtained which is soluble in water. On shaking the aqueous solution with a third of its volume of ether a reaction apparently identical with the original ether reaction is given, suggesting that the latter is due to the presence in the urine of the substance precipitated from it by alcohol. The aqueous solution of this substance gives: (1) a positive xanthoproteic test; (2) a positive Millon's test; and (3) a negative biuret test.

It will be remembered that coagulable albumin was found in the urine of the case of anaphylactic shock; it was also present in a case of multiple scalds, and is sometimes found during acute paroxysms of hay-fever, in serum sickness, and in severe urticaria. Albuminuria, however, is rare in chronic allergic conditions, nor does the urine give a precipitate on half saturation with ammonium sulphate. It is probable, therefore, that the substance which appears to be responsible for the ether reaction is a deutero-proteose, the exact nature of which is being investigated.

Urinary Acidity and Concentration.

The acidity of the urine varies according to the particular phase of the "allergic cycle." In the period preceding an attack the free acidity is, if anything, raised, but the acidity falls as the attack proceeds and diminishes, and the urine tends to become neutral and sometimes strongly alkaline with a deposit of phosphates. During the acid stage the urine is usually concentrated, and very commonly deposits urates on cooling, although uratic deposits may occur in urines of only moderate acidity and comparatively low specific gravity. During the alkaline stage it is dilute; a diuresis after asthmatic attacks, for example,

has long been noted clinically. A patient may, in fact, during the same period of 24 hours at one time pass a strongly acid concentrated urine with a deposit of urates, and at another a highly dilute urine with a deposit of phosphates. Moreover, in several of our cases the deposition of urates has occurred, and the free acidity has been highest in afternoon specimens, whereas the early morning specimen has been dilute and alkaline.

Ammonia Excretion.

The ammonia excretion is one of the most remarkable features of the allergic state because it does not correspond with the degree of acidity. The normal ratio between the free acid and the ammonia-combined acid excretion varies according to Davis and Rixon[43] from 1 : 0·6 to 1 : 1·5, 1 : 1 being probably the normal average according to our own investigations. For the sake of comparison the figures obtained by one of us (G. H. O.)[44] in specimens of urine collected hourly from a normal person are reproduced. (Table V.)

TABLE V.

Time.	Free acid.*	A.-c. A.	pH.	Ratio.	Time.	Free acid.*	A.-c. A.	pH.	Ratio.
		mg.*					mg.*		
8 A.M.	68·0	88·4	4·6	1 : 0·8	4 P.M.	22·0	23·8	5·0	1 : 0·64
9 A.M.	40·0	68·0	5·0	1 : 1·0	5 P.M.	36·0	44·2	5·2	1 : 0·8
10 A.M.	20·0	34·0	4·8	1 : 1·0	6 P.M.	26·0	25·0	5·3	1 : 0·74
11 A.M.	14·0	17·0	5·0	1 : 1·0	7 P.M.	20·0	23·8	5·5	1 : 0·7
12 noon	16·0	17·0	5·2	1 : 0·6	8 P.M.	36·0	23·8	5·3	1 : 0·4
1 P.M.	18·0	17·0	6·6	1 : 0·55	9 P.M.	40·0	23·8	5·0	1 : 0·35
2 P.M.	16·0	17·0	5·2	1 : 0·6	10 P.M.	44·0	50·0	5·3	1 : 0·5
3 P.M.	16·0	20·4	5·2	1 : 0·75	11 P.M.	72·0	70·0	4·9	1 : 0·55

* Per 100 c.cm. A.-c. A. = ammonia-combined acid.

It will be seen that normally the highest excretion of free acid and of ammonia-combined acid takes place in the early morning and evening, the so-called alkaline tide following meals. The ratio of free acid to combined acid was never greater than 1 : 1, and usually less. In persons with allergic symptoms the ammonia excretion is raised, often to an extraordinary extent, and the ratio is found to be abnormal at the period of and following the paroxysm. For example, a lady with asthma and lichenified eczema of the hands gave the figures shown in Table VI.

TABLE VI.

Time.	Free acid.	Ammonia.	Ratio.	Vol.	Vol. per hr.
				c.cm.	c.cm.
4.15 P.M.	38·4	81·6	1 : 1·5	120	—
8.0 P.M.	50·4	138·0	1 : 1·6	180	45
2.0 A.M.	29·4	134·0	1 : 3·0	210	35
5.0 A.M.	14·4	98·0	1 : 4·0	180	60
6.30 A.M.	8·0	95·0	1 : 7·0	150	100
7.0 A.M.	−8	34·0	—	210	420
Total	132·6	580·6	1 : 2·6	1050	—

The asthmatic attack was nocturnal, and in the latter half of the night the free acid progressively diminished until 7 A.M. when the urine was alkaline, whereas the ammonia excretion lagged behind and at 6.30 A.M. a ratio of 1 : 7·0 was obtained. The diuresis accompanying the alkaline stage is well shown.

CASE 11.—A boy of 18 with asthma and prurigo. (Table VII.)

CASE 12.—Angeioneurotic œdema. (Table VIII.)

In Case 12 the attack of angeioneurotic œdema was already present when the investigations were begun, and adrenalin was administered after the first specimen of urine was examined. The figures show the very marked diuresis and the diminution of acidity with ultimate alkalinity, although the ammonia excretion remains high. Moreover, this progression towards the alkaline side is common to both asthma and angeioneurotic œdema and cannot be explained merely by

TABLE VII. (Case 11).

Time.	Free acid.	Ammonia.	Ratio.	Vol.	Vol. per hr.
Day of No Attack.					
				c.cm.	c.cm.
11.20 A.M. ..	24·0	91·8	1 : 2	150	—
5.15 P.M.	45·0	122·4	1 : 1·6	150	25
7.10 P.M.	23·0	67·3	1 : 1·8	90	45
5.45 A.M.	144·0	346·0	1 : 1·4	600	60
Total	236·0	627·5	1 : 1·5	990	—
Day of Attack.					
1.20 P.M.	16·0	122·4	1 : 4·5	90	—
4.10 P.M.	7·0	65·0	1 : 5·4	90	30
7.0 P.M.	12·0	38·0	1 : 2·0	90	30
4.30 A.M.	79·2	314·0	1 : 3·0	660	69
9.15 A.M.	27·0	128·0	1 : 2·8	270	54
Total	141·0	667·0	1 : 2·7	1200	—

the hyperpnœa that occurs in asthma. This alteration in the acid-ammonia ratio is described by Davis and Rixon as occurring in cyclical vomiting, a condition that we regard as belonging to the allergic syndrome.

TABLE VIII. (Case 12).

Time.	Free acid.	Ammonia.	Ratio.	Vol.	Vol. per hr.
				c.cm.	c.cm.
7.0 P.M.	52·8	157	1 : 1·7	330	—
8 P.M.: Adrenalin.					
6.0 A.M.	115·2	440	1 : 2·3	720	65
10.45 A.M. ..	Neutral	146	—	330	66
1.45 P.M.	,,	34	—	90	30
4.0 P.M.	−26·4	67	—	660	330
Total	142	884	1 : 3·6	2130	—

Urea, Creatinine, Uric Acid, and Chlorides.

The ammonia excretion, therefore, is raised in association with the paroxysms, and the other non-protein nitrogenous substances—viz., creatinine and uric acid—are also increased.

The diminution of the chloride content of the whole blood has already been noted. Examination of specimens of urine taken from a patient with active allergic symptoms at different times during the 24 hours has shown repeatedly that during the active stage there is retention of chlorides with a consequent low excretion of them in the urine, whereas after the paroxysms the excretion rises. This chloride retention has been shown to occur by Rackemann, Longcope, and Peters in serum sickness, and by Longcope and Rackemann in cases of urticaria. It is a well-known phenomenon in pneumonia and in other acute infections, such as scarlatina and typhoid fever. Kartamischew[45] and Urbach[46] have also emphasised its occurrence in pemphigus vulgaris and dermatitis herpetiformis. At the time of the post-paroxysmal rise in chloride excretion an estimation of the blood chloride may show higher figures than normal. This is illustrated in Case 13 (Table IX.).

CASE 13.—Spasmodic rhinorrhœa.

TABLE IX.—*Urine.*

Time.	Vol.	Free acid.*	A.-c. A.	Urea.	Cl.†	Ratio.
	c.cm.		mg.*	g. per c.cm.		
8 A.M. ..	240	34	129·2	3·2	2·8	1 : 2·2
11.20 A.M.	105	8	95·2	2·3	3·3	1 : 7·0
3.30 P.M.	450	Neutral	27·2	1·0	4·0	—
5 P.M. ..	210	−10	13·6	1·0	2·8	—
10 P.M. ..	240	20	68·0	1·2	3·4	1 : 2·0

* Per 100 c.cm. † Mg. per c.cm.

Blood.

	mg. per 100 c.cm.
Amino-acid	7·0
Serum chloride as NaCl	693
Whole blood chloride as NaCl	561

The specimen of blood was drawn at about 11.30 A.M., at the time of the high post-paroxysmal excretion of chloride. After the paroxysm the chloride that has been retained in the tissues presumably passes again into the blood (the chloride content of which is therefore raised) and is then excreted by the kidneys.

We have found complete absence of chlorides in the urine in (1) anaphylactic shock following an injection of pituitary extract which contained protein, (2) serum-sickness, and (3) cyclical vomiting; and marked diminution of the chloride excretion in migraine during the attack. In all probability it is a protective mechanism; the experiment of Richet and others on the prevention of anaphylactic shock in animals by the injection of sodium chloride support this view.

Retention of Chlorides Preceding and During Attack.

CASE 14.—Angeioneurotic œdema; urticaria; egg-sensitiveness (Table X.).

TABLE X.

Time.	Free acid.	Vol.	NH_3.	Cl.†	Urea.	Ratio.
		c.cm.			g. per c.cm.	
9.0 A.M. ..	−9·7	50	31·6	3·6	2·1	—
1.0 P.M. ..	−0·3	100	31·6	4·8	1·4	—
8.15 P.M. ..	22	100	68·0	5·0	3·1	1 : 2
10.30 P.M.* ..	98	30	153·0	3·0	3·6	1 : 1
7.45 A.M.* ..	68	100	129·0	0·9	3·1	1 : 1
8.30 A.M.* ..	66	70	125·8	0·9	3·1	1 : 1

* Urates deposited. † Mg. per c.cm.

In this case the first specimens were collected in the post-paroxysmal stage within 24 hours of the attack. In spite of the alkalinity of the urine there was a considerable excretion of ammonia. (The specimens were examined within a few minutes of being passed.) The chloride excretion was gradually rising. The later specimens were collected in the pre-paroxysmal stage, another attack occurring during the second day. It will be noted: (1) that these specimens deposited *urates*, (2) that the free acidity is high with a correspondingly high ammonia excretion, and (3) that the chloride excretion rapidly falls. The urea excretion is low—the patient being on a normal full diet—13·35 g. for the 24 hours, the normal figure being about 30 g. on an average diet.

The van den Bergh Reaction.

Recently one of us (G. H. O.) has sought for further evidence of disturbance of hepatic function by testing the van den Bergh reaction in our patients. The number of cases examined up to the present is too small for any definite conclusions to be drawn, but the results so far are probably of significance. (Table XI.)

TABLE XI.

	D.D.	I.	N.
1. Boy. Hay-fever. Formerly infantile eczema and prurigo	+	+	—
2. Boy. Prurigo localised to the hands and wrists. Formerly cyclical vomiting ..	+	+	—
3. Girl. Prurigo of Besnier type. Asthma and hay-fever	+	+	—
4. Man. Severe asthma and Besnier's prurigo	+	+	—
5. Woman. Besnier's prurigo. Asthma ..	+	+	—
6. Girl. Besnier's prurigo. Asthma	+	+	—
7. Boy, aged 9. Hebra's prurigo	—	+	—
8. Girl, aged 11. Hebra's prurigo	+	+	—
9. Man. Light-sensitisation of adult type ..	+	+	—
10. Woman. Ditto	+	+	—
11. Woman. Angeioneurotic œdema	+	+	—
12. Man. Urticaria following salvarsan injections	+	+	—
13. Man. Asthma of recent origin (quiescent stage)	—	—	+
14. Girl. Asthma (quiescent stage)	—	—	+
15. Man. Eczema occurring for first time in adult life. Ichthyotic	—	—	+
16. Woman. Urticaria. Angeioneurotic œdema	+	+	—

D.D. = delayed direct. I. = indirect. N. = negative.

Cases 1 and 16 in the above series also gave a positive Fouchet test. When positive the van den Bergh reaction in these patients is of the biphasic type, corresponding to that found in the toxic, and not the obstructive form of jaundice.

A number of patients with clinical symptoms and signs of hepatic disease were investigated along the same lines. (Table XII.)

TABLE XII.

	—	Amino-acid content of blood.	Blood serum NaCl.	Whole blood NaCl.	van den Bergh. D.	van den Bergh. I.
		mg.*				
1	Cirrhosis	7·0	528	346	+	+
2	,, ...	5·2	511	380	+	+
3	,, ...	—	577	380	+	+
4	,, ...	—	570	396	+	+
5	Gumma of liver (treated with N.A.B.)	—	528	346	+	+
6	Jaundice after tonsillectomy	5·8	—	390	+	+
7	Gall-stones with jaundice	—	561	475	+	+
8	Infective cholangitis ..	—	525	411	+	+

* Per 100 c.cm. D. = direct. I. = indirect.

All these cases, except the patient with gall-stones, gave a low whole blood chloride figure. In two other cases, one of salvarsan intolerance and one of carcinoma of the head of the pancreas with jaundice, the following figures were found. (Table XIII.)

TABLE XIII.

—	Amino-acid content of blood.	Blood serum NaCl.	Whole blood NaCl.	van den Bergh. D.	van den Bergh. I.
	mg.*				
Salvarsan intolerance ..	7·7	594	429	+	+
Carcinoma of pancreas ..	—	503	462	+	+

* Per 100 c.cm.

TABLE XIV.—*Urine.*

	—	Acid.	NH_3.	Cl.	Urea.	Ratio.	Vol.
1	Cirrhosis.. ..	44	194	0·4	4·0	1 : 2·6	25 oz.
2	,, ...	30	159	0·4	3·5	1 : 3·2	30 oz.
3	,, ...	30	170	—	2·2	1 : 3·5	—
4	,, ...	42	112	—	3·25	1 : 2·6	400 c.cm.
5	,, ...	48	197	2·2	2·3	1 : 2·5	—
6	Jaundice after tonsillectomy ..	22	125	Nil	3·8	1 : 3·4	—
7	Infective cholangitis	8	78·2	1·2	1·0	1 : 5·7	—

1, 2, 4, = 24 hours specimen; 3, 5, 6, 7 = early morning specimen.

These figures show the same rise in the quantity of ammonia-combined acid excreted that we have found in allergic cases, with a similar alteration in the ratio between free acid and the ammonia-combined acid. There is also the same diminished chloride excretion.

It is interesting to compare the figures obtained (*a*) in a child with cyclical vomiting, and (*b*) in a case of severe scalds. Davis and Rixon have found the same alteration in the ratio in cases of cyclical vomiting. (Table XV.)

TABLE XV.

—	Free acid.	A.-c. A.	Cl.	Urea.	Ratio of free to comb. acid.	Vol.
Cyclical vomiting ..	6	71·4	0	1·7	1 : 7	15 oz.
Multiple scalds ..	18	224·4	0·05	1·62	1 : 7	—

In the latter case the urine contained albumin, uratic deposit with bile-salts, and biliverdin in large amounts. Here we see the same high excretion of ammonia-combined acid, the altered ratio and low chloride output; the involvement of the liver is shown by the excess of bile-salts and the bile-pigment in the urine.

The methods used in these investigations have been:—

For the Urine.

(*a*) Free acid; direct titration.

(*b*) Ammonia-combined acid: Folin's method, using formalin and potassium oxalate.

(c) Urea; hypobromite method.
(d) Chlorine: silver nitrate and potassium thiocyanate in the presence of pure nitric acid, using ferric ammonium sulphate as indicator.
(e) Uric acid: Folin's colorimetric method.
(f) Creatinine: Folin's picric acid method.
All the specimens examined were preserved with toluol from the time of passing.

For the Blood.

(a) Amino-acid: Folin's colorimetric method, using sodium beta-naphthoquinone-sulphonic acid as reagent.
(b) Chlorine as above.
(c) Uric acid: Folin's method.
(d) van den Bergh reaction: according to the original technique.
All these methods are described in Folin: "Laboratory Manual of Biological Chemistry," 1925; D. Appleton and Co., New York, with the exception of the van den Bergh reaction.

PRINCIPLES OF TREATMENT.

Our investigations have dealt with only one—the biochemical—side of the extremely complex problem of anaphylaxis and allergy, and by no means completely with that. We have been tempted to discuss the whole question, more particularly in connexion with the work of Dale and Laidlaw on histamine and histamine shock,[47] of Lewis and his co-workers,[4] and of Roger and Garnier, Draper, Whipple and his collaborators, Haden and Orr, Binet, and many others on experimental intestinal obstruction. (An admirable review of this last subject, with full bibliography and personal observations, has recently been published by Binet.[48]) Such a discussion, however, would be beyond the scope of this paper, and we will merely remark that the views on anaphylaxis, wound shock, and "protein sensitivity" tentatively put forward by Lewis,[49] and the biochemical investigations that have been made in cases of intestinal obstruction, more particularly by Haden and Orr,[38] may prove of great significance both in the elucidation of the exact nature of the allergic reaction and in its treatment.

In intestinal obstruction the most striking biochemical changes are the reduction of chloride in the blood—and, according to Haden and Orr, in the liver and to a lesser extent in the muscles—together with a lowered chloride excretion in the urine and later a rise in the non-protein nitrogen and of the bicarbonate in the blood. It is clear that the chloride is fixed somewhere, and Haden and Orr suggested, as Richet in his experiments on anaphylaxis had already done, that it combines with the toxin to form a non-toxic product according to the following formula:—

$$\underset{\text{Toxin}}{X} + NaCl + H_2Co_3 = XHCl + NaH\ Co_3.$$

The resulting alkalosis is thus clearly explained, and the hypothesis is confirmed by the remarkable results obtained both experimentally and clinically by the injection of hypertonic saline to combat the symptoms of toxæmia and prolong life in intestinal obstruction. Our investigations show that in the allergic cycle there is, at one period, the same reduction of chloride in the blood, the same chloride retention, as evidenced by a lowered or absent excretion in the urine, and the same rise in the non-protein nitrogen of the blood. Moreover, although in the initial stage of the cycle there is a rise in the free acidity and of the ammonia-combined acid, this is followed by an apparent alkalosis which is accompanied by a diuresis. Since injections of sodium chloride are specific in overcoming the toxic symptoms of intestinal obstruction (other chlorides are useless, and of the salts tested only sodium bromide appears to have a similar effect), and are also capable of preventing experimental anaphylactic shock, one might expect them to be of value in allergic conditions, but we have not as yet employed them.

The principles upon which our treatment has been based are as follows:—

1. Seeing that, apart from cases in which it obtains access to the tissues parenterally—e.g., in hay-fever—the antigen responsible for allergic conditions is absorbed from the alimentary tract, and presuming that either specific food proteins, the intermediate products of protein digestion, or toxic substances resulting from bacterial action on protein, are in question, we have instituted in many cases a more or less vegetarian dietary.

2. Believing that the high excretion of ammonia might be a protective mechanism, one of us (G. H. O.) administered considerable doses of sal volatile.

3. Since our investigations tend to confirm the views of those who hold that the liver plays an essential rôle in the drama of the anaphylactic reaction—as Roger has said, "the liver is the principal gland that intervenes in order to maintain or re-establish the chemical constitution of the organism"—we have sought to protect it both by a rational dietary and by prescribing additional glucose in order to increase the glycogen content of the liver cells.

4. To patients who show clinical evidence of exhaustion of the adrenal sympathetic system, as is usual in the chronic and severe cases of the asthma-prurigo group, we have given ephedrine hydrochloride.

We have purposely avoided employing the well-recognised methods of specific and non-specific desensitisation, and have seldom availed ourselves of the striking effect that real or artificial heliotherapy produces on patients with allergic symptoms.

The above principles may now be considered in more detail, but it will be understood that the exact line of treatment in a given case must obviously depend on the nature of the predominant symptoms, on their acuteness or chronicity, and on any special features peculiar to the case.

Diet.

It is sometimes said that dietetic treatment is of no account in many of the conditions under discussion—e.g., infantile eczema, papular urticaria, and the prurigos. On the other hand, both Rasch and Haxthausen are emphatic concerning the value of a lacto-vegetarian régime in Besnier's prurigo. The former goes so far as to say that it is the only method of treatment that gives any permanent relief, and he has found it successful not only in mitigating the prurigo but also in preventing the accompanying asthmatic attacks. We believe that the clue to a rational diet lies in a consideration of the functions of the liver in dealing with proteins and their derivatives. It is known that the liver fixes albuminous substances in its parenchyma (the "protéopexie" of Widal, Abrami, and Ivanesco), and that, if this function be interfered with experimentally, symptoms of shock supervene. In dogs with an Eck's fistula feeding with meat produces a state described by Fr. Fischler[50] as "Fleischintoxikation," thus illustrating the important function of the liver in protecting the body against foreign proteins. Its power of transforming the products of protein digestion—albumoses, peptones, polypeptides, and amino-acids—into the non-toxic urea is normally more important still. Finally, the liver renders non-toxic the products of bacterial action on undigested protein and, as Roger has shown, is capable of destroying bacteria themselves.

Now in those cases in which the antigen is absorbed from the alimentary canal we recognise (1) a group in which there is well-defined specific food sensitiveness, and (2) a group in which this is not apparent. In the first group it is presumably the proteopexic function of the liver that is tested and, when allergic symptoms occur, fails. From the work of A. and M. Walzer[51] on urticaria it would appear that the offending food substance is absorbed unchanged or incompletely digested and, reaching sensitised tissue, produces a local response due to antibody-antigen interaction. Their experiments are based on the well-known Prausnitz reaction. By injection of an area of skin of a normal non-sensitive person with the serum of one known to be sensitive to a certain food substance, and then feeding him with the food in question, an urticarial wheal is produced at the site of injection of the sensitised serum. Their observations are supported by those of Lewis and Grant,[52] who experimented with a fish-sensitive person; but Lewis remarks that the active substance producing the

allergic response appears to be neither a coagulable protein nor histamine, and A. and M. Walzer observed that heating, baking, or canning the offending food protein, diminished, delayed, or prevented the response. This would suggest that the actual antigen is a specific substance that is fairly easily destroyed or changed. Moreover, A. and M. Walzer found that, whereas hyperchlorhydria tends to retard or prevent the reaction, achlorhydria tends to accelerate it, indicating that this specific substance is destroyed early in normal gastric digestion. We believe that the secretion of hydrochloric acid by the stomach may be an important factor in allergy of alimentary origin. We have not done fractional test-meals in a sufficient number of cases of the asthma-prurigo group or in cases of chronic urticaria to be able to state whether hypo- or a-chlorhydria are usual, but in light sensitisation of the adult type Howitt and one of us (H. W. B.) found very marked hypochlorhydria or complete achylia in 80 per cent. of cases.[53]

To sum up: in cases of allergy due to specific food sensitiveness it would appear that the protein in question, with the specific substance producing the allergic reaction, may be absorbed unchanged into the blood stream. This is more likely to occur if the food is taken in its natural state, if the secretion of hydrochloric acid in the stomach is deficient, and if the proteopexic function of the liver fails.

In the second group, in which no specific food sensitiveness can be determined but in which the alimentary tract is clearly the source of the toxin responsible for the allergic symptoms, it is probable that incompletely digested protein-cleavage products derived from various food proteins, and bacterial toxins or the products of bacterial action on proteins, are absorbed, escape destruction in the liver, and produce the symptoms. In this case it is the detoxicating function of the liver that fails.

From these considerations it is clear that diet is of great importance but, apart from cases of specific food idiosyncrasies, it is probably not so much a question of the actual foods taken as of the capacity of the digestive organs and of the liver to deal with them. Hence a person who is compelled by experience to diet himself strictly under sedentary and trying conditions may often eat and drink with impunity when leading an outdoor and care-free life. The essential clue to the problem lies in the *functions* of the digestive organs and of the liver. We do not believe that there is any particular virtue in the lacto-vegetarian diet per se. In fact, the influence of cow's milk is sometimes definitely harmful, particularly in cases of infantile eczema, many of which improve promptly when cow's milk is excluded, and in older children with asthma and Besnier's prurigo, who are often given large quantities of cow's milk "to fatten them" in addition to a fully adequate mixed diet. The success of a lacto-vegetarian régime is, we are convinced, due to the reduction and simplification of the protein intake. What is important to realise is that the asthma-prurigo group of patients, with their highly developed and supersensitive nervous systems, are metabolically very unstable, and their ability to digest and metabolise proteins is limited. But their restlessness, both of mind and body, tends to rapid exhaustion, which is apt to precipitate the paroxysms of asthma or itching, and to induce the ketosis that characterises cyclical vomiting.

The rules of diet that we prescribe are similar to those advocated in cases of hepatic insufficiency, with such modifications that the nature and severity of the symptoms and the idiosyncrasies of the individual patient may require—viz., restriction of or abstention from meat and fish, and sometimes from eggs; an abundance and a variety of cooked and raw vegetables and fruit, the cellulose of which is of such importance; farinaceous foods, preferably in a form that compels mastication; cheese; fresh butter; glucose in preference to cane sugar. Meat and fish, when allowed, should be freshly and plainly cooked without fat (other than butter) or rich sauces. In addition we have convinced ourselves of the value of sour milk with lactose in certain cases, particularly of light sensitisation and of dermatitis herpetiformis. Our most striking successes with this kind of dietary have been obtained in Besnier's prurigo, certain forms of eczema and prurigo in adults, light sensitisation, and dermatitis herpetiformis. Unfortunately the limitations of English cooking render such a régime unnecessarily difficult to enjoin and irksome to follow.

Ammonia.

One of the most striking features of the allergic cycle is the increased excretion of ammonia, whereby the ratio of free acid to ammonia-combined acid is altered. We are doubtful whether or not the high ammonia excretion is called forth merely in response to an acidosis. It occurred to one of us (G. H. O.) to try the therapeutic effect of administering ammonia in the form of sal volatile by the mouth. During the past nine months a large number of patients have been treated in this way, with 30 minims to 2 drachms of spiritus ammoniæ aromaticus, according to age, in a tumbler of water thrice daily before meals. At one time we prescribed it in a mixture with sodium sulphate, potassium bicarbonate, sodium phosphate, and sodium chloride, but we think it is more efficacious if given alone, freshly mixed with water. We have never seen any ill-effects from its use, except that a few patients have complained that it gave them indigestion. It is probable, in fact, that larger doses could be tolerated and, perhaps, would be more effectual. It should be taken, according to our experience, about half an hour before meals, and perhaps at bedtime.

It is difficult to estimate the value of sal volatile alone in the treatment of allergic symptoms, but our impressions are as follows:—

1. That in hay-fever, migraine, and urticaria its action may be very striking, both in preventing and aborting the attacks. In over a dozen cases of hay-fever it has appeared to be almost specific. Dr. Moreland McCrea has kindly tried it in cases of migraine with very successful results. In urticaria the effect seems to vary; some patients have done well, but in others it has proved disappointing.

2. In patients belonging to the asthma-prurigo group its immediate effect is less obvious but, given regularly over a long period of time, in combination with suitable dietetic treatment, it has seemed of definite benefit. The same may be said of cases of light sensitisation of the adult type.

We have not treated enough cases of asthma, uncomplicated by prurigo, to express any opinion as to its efficacy.

Glucose.

The value of glucose, with or without the simultaneous administration of insulin, in the treatment of various conditions is becoming more and more apparent; the literature concerning its uses is already formidable and cannot be reviewed here. Its cardinal virtue is, we believe, that it affords the simplest and most rapid method of increasing the glycogen content of the liver. Roger[54] and Fiessenger and Walter[27] have insisted that the glycogenic function is of paramount importance in the physiology of the liver. As Fiessenger and Walter point out, glycogen is essential (1) for the antitoxic function, since it allows of glycuronoconjugation and of destruction of bacteria, which does not occur if the liver has been deprived of its glycogen by fasting; (2) for the protein function, since the destruction of amino-acids, of beta-oxybutyric acid, and of acetone bodies only takes place in the presence of glycogen; (3) for the lipopexic function; and (4) for the pigmentary function.

If, therefore, we ascribe to the liver a preponderating rôle in the defensive mechanisms of the body, it is clear that one of the chief therapeutic indications in hepatic disease and in allergic and allied conditions is to ensure an adequate supply of sugar, in order to increase the glycogen content of the liver cells. For this purpose feeding with glucose or, in cases of urgency, its administration by the intravenous and rectal routes, is the method of choice.

We have found it of especial value (*a*) in children belonging to the asthma-prurigo group, most of whom portray to perfection the characteristics of "the nervous child" so graphically described by Cameron,[55] who himself has long advocated its use; (*b*) in the thin hypotonic adult patient—usually female—in whom simple prurigo is so common a symptom; under-nutrition is here an important factor, and for it Izod Bennett[56] has rightly described glucose as "the most valuable fluid food available"; (*c*) in patients in whom there is unmistakable evidence of chronic hepatic insufficiency. We have also given it with striking success, usually in combination with sal volatile or sodium bicarbonate, in the prurigo of pregnancy, and as a preventive of the toxic effects of deep X ray therapy and of metallic drugs, such as salvarsan and sanocrysin.

Dodds[57] has shown that even 500 g. of glucose does not produce glycosuria in the majority of normal men, and Izod Bennett advises as much as 1 lb. per diem in severe cases of under-nutrition. We usually prescribe from 2 to 4 ounces daily in divided doses, both with and between meals.

SUMMARY AND CONCLUSIONS.

The points we would emphasise in the foregoing account of some of our investigations into the metabolism of allergic conditions are as follows:—

1. Certain phenomena have been demonstrated to occur with remarkable constancy in various manifestations of the allergic state; some of these have already been described by others in experimental anaphylaxis and in serum sickness, which is generally admitted to be truly anaphylactic in origin.

2. In the allergic state, whether it be intermittent, as in certain cases of urticaria, angeioneurotic œdema, asthma, or hay-fever, or whether it be more or less chronic with periodical exacerbations and remissions, as in Besnier's prurigo and infantile eczema, there can be recognised a definite cycle of events corresponding to the pre-paroxysmal stage, the actual paroxysm, and the post-paroxysmal stage. In this cycle the most striking features are: (*a*) The rise in the amino-acid content of the blood. (*b*) The fall in the chloride content, particularly of the corpuscles, due presumably to the chloride being taken up by the tissues. (*c*) The retention of chloride, so that its excretion is diminished or absent in the urine during the paroxysms, and its subsequent excretion in increased amount after the paroxysms, at which time the chloride content of the blood may also be raised. (*d*) The rise in the urinary excretion of ammonia, so that the ratio of free acid to ammonia-combined acid is altered, often very strikingly. (*e*) The deposition of urates in the urine in the pre-paroxysmal or paroxysmal stage. (*f*) The intensity of the ether reaction during the periods of active symptoms. (*g*) The diuresis, with decreasing acidity and sometimes marked alkalinity of the urine, in the post-paroxysmal stage.

3. The positive van den Bergh reaction of the biphasic type in a large proportion of the cases so far examined.

4. The similarity of the findings in a case of anaphylactic shock, in a case of multiple scalds, and in patients with definite hepatic disease.

It is possible that the raised amino-acid content of the blood in these cases results partly from: (*a*) the increased endogenous katabolism that occurs in anaphylactic and allergic reactions, as shown by the increased formation of creatinine; (*b*) from the relative temporary hepatic insufficiency caused by the damage to the liver cells, as evidenced by the positive van den Bergh test; (*c*) from the interaction of the antigen and the "defence-ferments" of Abderhalden[58] whereby amino-acids are formed. In any case, the positive van den Bergh reaction, the raised amino-acid content of the blood, and probably the increased ammonia excretion, the precipitation of urates, and the ether reaction in the urine, are indicative of a disturbance of hepatic function. It is likely that the increased ammonia excretion and the temporary retention of chlorides are protective mechanisms. A dietary based on our interpretation of these findings, and the internal administration of ammonia and glucose, have proved of definite therapeutic value in many allergic cases.

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ULTRA-VIOLET LIGHT AND SKIN CANCER.

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(From the Laboratories of the Imperial Cancer Research Fund, London.)

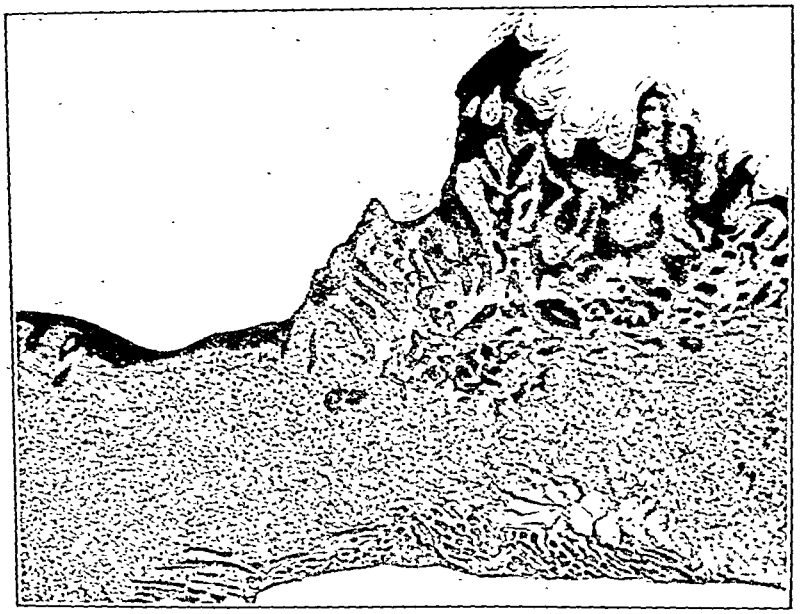
IT has long been known that prolonged exposure to the weather may produce in the exposed skin changes which not infrequently terminate in cancer. These changes were first described by Unna (1896) under the name "Seemanshaut," since the condition is especially common in sailors. Similar changes often associated with atrophy are, however, by no means rare in the skin of old country people, one of the commonest sites for the lesions being, as Lenthal Cheatle (1908–09) has pointed out, the skin over the posterior surface of the second metacarpal bone, an area which is also the commonest site for the development of cancer of the skin of the hand. In all countries where a white population is exposed to prolonged sunlight, keratotic changes in the skin are far from rare and in association with these keratoses, cancer of the skin not infrequently develops. In this country, according to Young and Russell (1926), fishermen, bargemen, and lightermen show an excess of facial cancer; agricultural labourers, farm servants, farmers and graziers, an excess of cancer of the hand. Among gardeners also, the amount of cancer of the hand is considerably in excess of what should be expected. The possibility that the sun's rays may play a part in this excessive production of skin cancer has not lacked supporters.

In France Dubreuilh (1907, 1915, 1920, 1925) in a number of publications has emphasised the ætiological importance of sunlight in keratosis and epithelioma of the skin, since these lesions, while rare in town-dwellers, are common in country folk. Bellini (1909) in Italy has reported similar findings.

In America Hyde (1906) points out that the coloured races suffer much less from skin cancer than the whites, among whom cancer of the face, neck, and hands is specially common in agricultural labourers. Corlett (1915) and McCoy (1920) also emphasise the importance of occupation and pigmentation in the genesis of skin cancer. In the latter's series of cases the distribution of cancer of the face, neck, and hands, according to the colour of the skin, showed that 62 per cent. occurred in blondes, 31 per cent. in chatains, that is, those with dark hair and little skin pigment, and 7 per cent. in the dark skinned.

In Australia Molesworth (1927) shows that rodent ulcer and epithelioma of the exposed portions of the skin are far more common than in this country. As in other countries with much sunlight, there is the same marked tendency for skin cancer to be common in the country and rare in the town. Rodent ulcer and epithelioma both develop in relation to pre-existing keratoses, more especially when the skin is poorly pigmented. Since those of Scottish and Irish descent have, as a rule, fair skins, the incidence of skin cancer of the face, hands, and neck is greater in these races than among the general population; while among Italians, on the other hand, skin cancer is very rarely seen. Quite recently Lawrence (1928) has suggested that in Australia the irritating action of the solar rays is accentuated by the relatively low humidity of the atmosphere. Among 20,000 patients with skin diseases seen in private practice there were 1374 rodent ulcers and 395 epitheliomata. Although the statistical value of these clinical observations may not be high, nevertheless the facts strongly suggest that sunlight, and more especially ultra-violet light, may play an important part in the genesis of skin cancer. Although no case of skin cancer due to the therapeutic use of ultra-violet light has yet been reported, Colquhoun (1927) has nevertheless recorded the production of multiple keratoses on the chest of a man, aged 27 years, who had received quartz light therapy for some eighteen months, while Cheatle (1925) has noted that in skin "bronzed" by therapeutic exposure to sunlight there is very active mitosis in the epithelial cells situated above the basal layer.

FIG. 2.

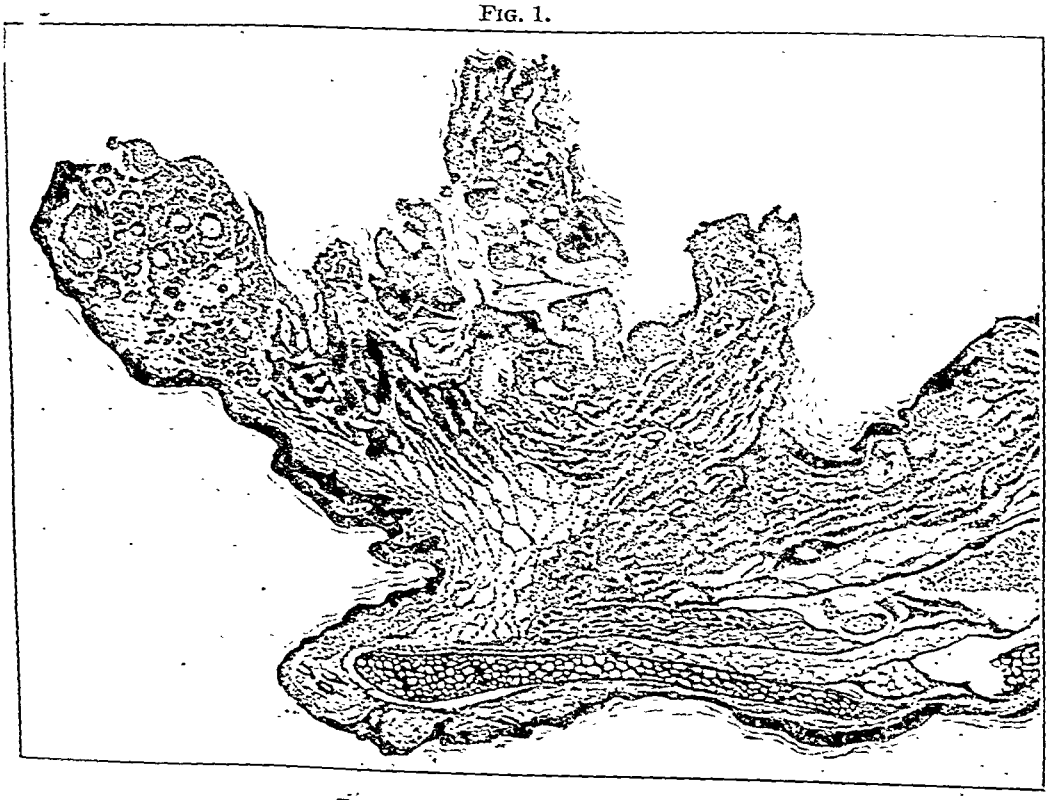


Tumour from the back of mouse No. 14 (× 20).

Experimental Procedure.

In order to determine experimentally whether ultra-violet light had any carcinogenic action on the

FIG. 1.



Tumour from ear of mouse No. 13 (× 20).

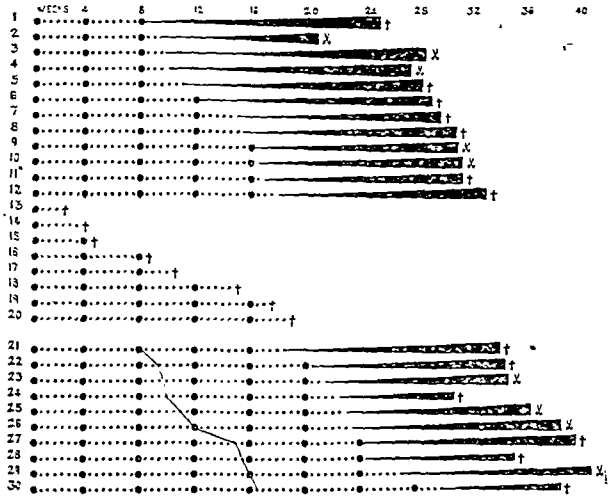
skin, a series of experiments were carried out on mice.

The source of ultra-violet light was a quartz mercury-vapour lamp manufactured by the Hewittic Electric Company, Limited, of Hersham, Surrey. The lamp is fitted with a standard Y 2 Ulviarc burner, functions on 200–300 volts, and has an amperage of 3·5. The spectrum of the mercury arc is said to cover a range from 2000 A.U. in the ultra-violet to 10,140 A.U. in the infra red; it is, however, deficient in red and infra-red rays. The mice, which were of the albino variety, were at first epilated with a solution of sodium sulphide on an area of the back between the shoulders, as is usually done in applying tar for carcinogenic purposes. After from one or two months exposure, there was no further need of any depilatory.

The mice were exposed to the light by placing them in a sanitary bin 15 in. in diameter, fitted with a false bottom of perforated zinc. The mercury-vapour lamp was placed on a wooden frame which fitted over the

Charts showing the Acceleration of the Carcinogenic Action of Tar by Exposure to Ultra-violet Light.

CHART 1.



1–20 = Mice tarred twice weekly and exposed to the mercury-vapour lamp for two minutes four times a week.
21–30 = Mice tarred twice weekly.

top of the bin in such a way that the rays of the lamp were directed downwards into the bin, the false bottom of which was 18 in. distant from the light.

In the first two experiments, the effect of combining ultra-violet light with a known carcinogenic agent, such as tar, was investigated. In the last experiment the effect of ultra-violet light alone was studied.

Expt. 1.—Thirty albino mice were tarred twice a week over a small area of the back with a known carcinogenic tar. Ten of the mice served as controls. The other 20 mice were exposed for 2 minutes four times a week to the mercury-vapour lamp. The results are shown in Chart 1. In this and the succeeding chart, the applications of tar are represented by dots, the commencement and growth of the tumours by the solid cones. Death of the animal is shown by a †, operation by a pair of scissors. From Chart 1 it will be seen that cancer of the skin occurred more rapidly in those mice which were treated with tar and ultra-violet light than in those treated with tar alone.

Expt. 2.—Leitch (1922) showed that if tarring was continued for from four to five months and then stopped, certain mice developed carcinomata a considerable period after the cessation of the tarring.

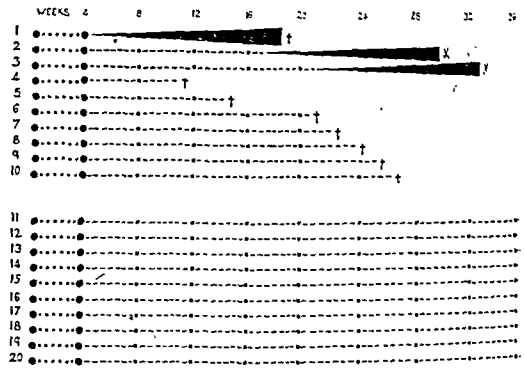
Twenty mice were tarred as before for four weeks, and during the same period ten were exposed to ultra-violet light for 2 minutes daily. Both tarring and irradiation were discontinued at the end of this period. In those mice which were tarred and irradiated, three tumours appeared, while in the mice which were only tarred no tumours developed. The three tumours which appeared in the irradiated group were of a definitely malignant character.

The question of whether the accelerating action of ultra-violet light on tar carcinogenesis is due entirely to a local effect or to a combined local and systemic action is now being investigated experimentally.

Expt. 3.—In view of these results, experiments were undertaken to determine whether ultra-violet light alone had any carcinogenic action.

Twenty mice were used in the experiment, the exposure being 1 minute daily. Five months later the exposure was

CHART 2.



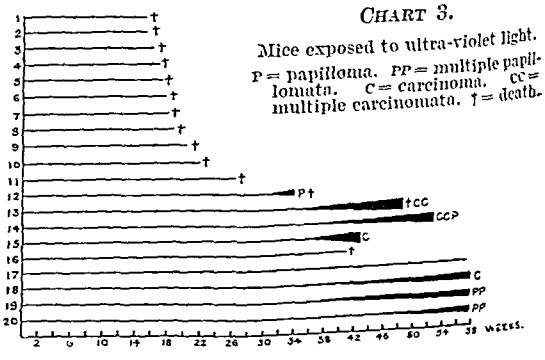
1–10 = Mice tarred twice weekly and exposed to the mercury-vapour lamp for one month.
11–20 = Mice tarred twice weekly for one month.

increased to 2 minutes daily and then after a further two months to 3 minutes, four times a week. In order to lessen the mortality, any mouse which showed a very severe reaction accompanied by ulceration escaped further exposure until the lesions showed signs of healing.

The general course of the experiment is seen in Chart 3. The first growth appeared in a mouse 217 days after the beginning of the experiment. At this time there were eight other mice alive, of which six subsequently developed tumours, two of these growths remained in the papillomatous stage, while in the other four mice there were six malignant growths and one papilloma. The mice dying before the appearance of the first tumour showed in their skins the changes typical of chronic solar dermatitis. The vessels of the cutis vera were dilated while the surrounding tissues

CHART 3.

Mice exposed to ultra-violet light.
P = papilloma. PP = multiple papillomata. C = carcinoma. CC = multiple carcinomata. † = death.



were infiltrated with round cells. The epidermis showed in some areas hypertrophy and irregular thickening with hyperkeratosis; in other areas reduction to a single layer of cells.

The following is a brief account of the growths occurring in the tumour-bearing mice.

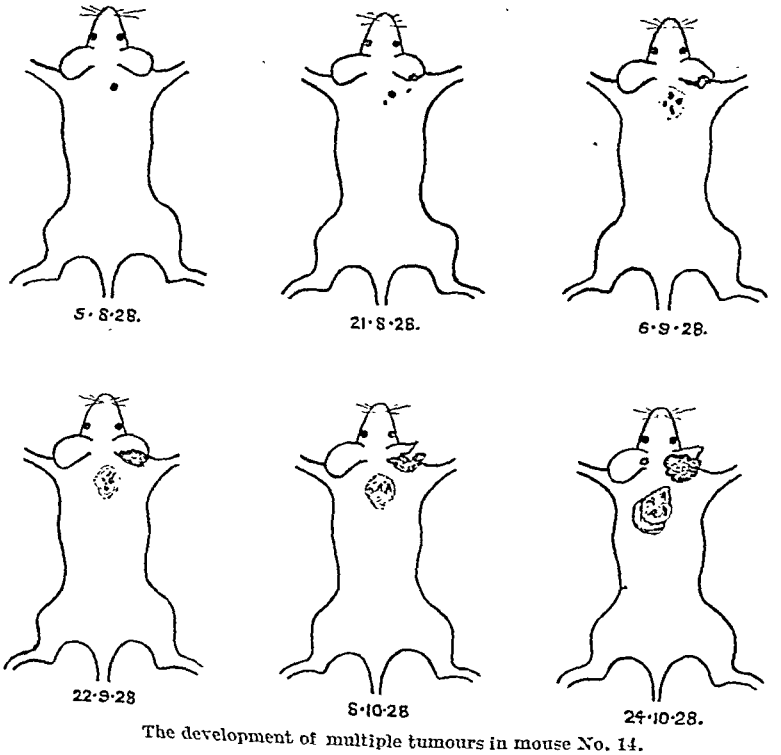
Mouse 12.—A small papillo[illegible] at the base; there was no [illegible] carnosus. The mouse died 18 days after the first [illegible] of the growth.

Mouse 13.—A small wart-like growth first appeared on the anterior aspect of the pinna of the right ear. This grew slowly, finally ulcerating through on to the posterior surface

of the ear. The structure of this tumour is seen in Fig. 1. Ten days after the appearance of the ear tumour a small papilloma was noted on the back; a second papilloma appeared a week later. These papillomata at first grew slowly; then after some six weeks the skin around the papillomata became thickened and a large horny growth resulted. The tumour was operated on and autoplasts made. Unfortunately, the tumour was infected and both autoplasts ulcerated out. At death, however, the left axillary gland was found to contain a metastasis. Histological examination of the tumour showed a cancroid very similar in character to those commonly produced in the mouse by tar painting.

Mouse 14 had a very similar history to that of No. 13. Three papillomata first appeared on the back; after progressing slowly for a time they took on active growth forming a large horny mass; in the meantime a warty growth had appeared on the anterior aspect of the right ear, gradually involving the whole of the pinna. Ten weeks after the first papilloma had been noted on the back a single small papilloma appeared on the dorsum of the pinna of the left ear. The growth on the back was operated on and autoplasted with subsequent growth. The tumour on the right ear had histologically the appearance of an epithelioma with keratinisation and cell nests. The superficial portion of the tumour on the back had a similar appearance, but the deeper portion had the characteristics of a small spindle-celled sarcoma. (Fig. 2.)

CHART 4.



The development of multiple tumours in mouse No. 14.

Mouse 15.—Three small papillomata first appeared on the skin of the back. The skin surrounding these growths rapidly thickened, forming a rounded firm mass about the size of a threepenny-piece. The tumour was removed at operation and two autoplasts made in the mouse. Both the autoplasts grew slowly. Six weeks after the operation the mouse was killed and one of the autoplasts was transferred to normal mice. Growth occurred in 1 in 20 of these mice. Histologically the original growth showed in the more superficial areas down-growth of epithelium with typical cell-nest formation and keratinisation. The deeper part of the tumour, however, had a more sarcomatous appearance, consisting of large spindle-shaped cells. It was possible, however, to distinguish all gradations of cell types from the typical epidermal cells of the cell nest to typical spindle cells. The question therefore arises as to whether this tumour is to be regarded as a carcinoma or a carcino-sarcoma. The same problem has arisen in the interpretation of many tar tumours. In the autoplasts the prevailing cell was of the large spindle-shaped type; keratinisation was absent.

Mouse 18.—A small papilloma first appeared on the anterior aspect of the pinna of the right ear. Subsequently the whole ear was involved, the cartilage of the ear being disorganised.

Mouse 19 had three papillomata on the back and one small one on the left ear.

Mouse 20 had two small papillomata on the back.

In neither of these animals was there evidence of penetration through the panniculus carnosus.

Of the seven tumour-bearing mice, therefore, three have developed papillomata, while four have had growths which are of a definitely malignant type. In two of these four mice the malignant growths have been multiple.

Discussion.

The experimental evidence thus brought forward shows that mice exposed to the mercury-vapour lamp for a period of not less than eight months develop either simple papillomata or malignant epitheliomata. Further, when a known carcinogenic agent is at work on the skin exposure to ultra-violet light for a comparatively short period may lead to the rapid development of malignant new growths. These experiments, therefore, are in favour of the hypothesis based on clinical evidence that in man exposure to ultra-violet light plays an important part in the ætiology of cancer of the skin of the face, neck, and hands.

Conclusions.

1. By exposure of mice to ultra-violet light for a period of not less than eight months it is possible to produce papillomata and malignant epitheliomata of the skin.

2. When mice are tarred and exposed to ultra-violet light at the same time, the period necessary for the induction of cancer is shorter than when either tar or ultra-violet light alone is employed.

3. A series of mice tarred for one month failed to develop cancer, but when tarred and exposed to ultra-violet light for the same period three mice developed malignant growths.

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BETHLEM HOSPITAL.—The annual report of Sir Lionel Faudel-Phillips, the treasurer of Bridewell and Bethlem Hospitals, states that the out-patient departments were closed at Michaelmas, 1927. The average weekly cost of maintaining patients was £1 17s. The new hospital buildings on the Monks Orchard Estate were begun in June, and good progress has been made. The appeal for the building fund has, so far, produced £45,000, but a further £50,000 will be needed if the new enterprise is to start free of debt.

TONSILLAR HYPERTROPHY AND INFECTION AS A FACTOR IN ILL-HEALTH.

BY DONALD PATERSON, M.B. EDIN., M.R.C.P. LOND.,

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AND

G. W. BRAY, M.B., CH.M. SYD.,

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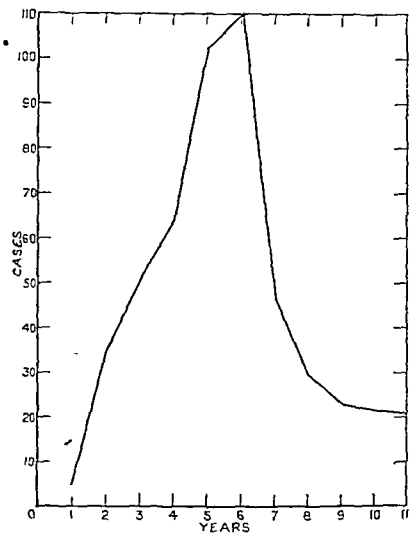
AT the out-patient department of a children's hospital many cases are seen with hypertrophied or infected tonsils, and the following study was undertaken to ascertain to what extent these contributed towards the child's symptoms and general ill-health. Our 500 cases were chosen from the out-patient department at the Hospital for Sick Children, Great Ormond-street, and the Westminster Hospital. As far as possible only those cases who had been observed and their weight recorded for periods up to six months before and after tonsillectomy were included. Very great difficulty was experienced in getting such a large number of cases, as the vast majority ceased to attend hospital immediately after the child had recovered from the operation. Of the 500 cases, 412 were observed for at least four to eight months continuously.

FIG. 1.



Sex-incidence.—Of the 500 cases, 277 (55·4 per cent.) were males, and 223 (44·6 per cent.) were females. This preponderance of males over females was noticed all through the records investigated.

Age-incidence.—275 of the 500 cases were between four and six years of age at their first visit to the out-patient department. This suggests that at this age infected tonsils give rise to their maximum symptoms. The age-incidence is shown in Fig. 1.

Chief Complaint.—In this series of cases the chief complaints were as follows:—

1. Respiratory group (145)—	
Coughs, colds, catarrhs	129
Asthma	16
2. Alimentary group (104)—	
Anorexia	46
Vomiting	28
Abdominal pains	8
Bilious attacks	7
Indigestion	6
Constipation	3
Diarrhœa	2
Worms	2
Jaundice	1
Fœtor oris	1
3. Nervous group (90)—	
Nerves	74
Fits	4
Headaches	4
Restlessness	2
Stuttering	2
Habit-spasm	2
Listlessness	1
Night-terrors	1
4. Wasting group (70)—	
Wasting	49
Run down	11
Debility	10
5. Rheumatic group (43)—	
Rheumatism	27
Chorea	11
Carditis	5
6. Ear, nose, and throat group (30)—	
Sore throats	13
Earache	12
Otorrhœa	3
Deafness	2
7. Urinary group (18)—	
Enuresis	14
Hæmorrhagic nephritis	3
Pyuria	1

It was noticed that when the child was first brought to hospital the symptoms complained of in all but a few instances did not refer to the throat.

Effect of Tonsillectomy on the Child's Weight.—After the initial fall immediately consequent on the operation, there was a continuous gain in weight in all cases. This was not uniform, however, as some of the groups gained to a greater extent than others.

FIG. 2.

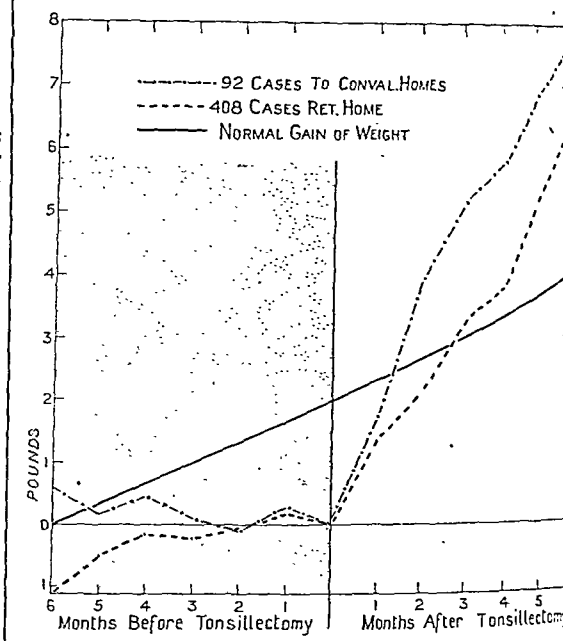


Fig. 2 shows the average weight before and after tonsillectomy. Examining this chart it will be appreciated that children sent to a convalescent home after tonsillectomy were on the average 1¼ pounds heavier at the end of six months than the less fortunate cases. We would stress the fact that the 92 children sent away were chosen because they had been actually losing weight during the six months prior to tonsillectomy. The remaining 408 had been either stationary or were showing but a feeble rate of gain.

Examining the various groups it will be noticed that Group 5, the rheumatic cases, showed the greatest improvement—that is, the average gain was 8·62 lb. The average gain shown by the other groups in the six months following operation was as follows: ear, nose, and throat group, 7·3 lb.; wasting and urinary group, 7 lb.; nervous group, 6·47 lb.; respiratory group, 6·27 lb.; alimentary group, 5·92 lb.

Discussion.

A review of the literature on this subject shows how very few papers include statistics. Moreover, most papers have been written by nose and throat surgeons, and their first observations have been at or about the time of operation. Analyses of the previous complaints and weight records are almost uniformly absent.

The benefits of tonsillectomy are outlined in a most convincing manner by Kaiser,[1] but his paper is open to the above criticisms. Barrington-Ward,[2] from the study of a large number of cases at Great Ormond-street, describes the problem and gives clear indications for the removal of tonsils. In a large number of cases of anorexia attending an out-patient department, studied by Bartlett,[3] the commonest pathological condition found was that of septic tonsils and adenoids. Brennemann,[4] in an admirable paper, pointed out the protean manifestations of nasopharyngeal infections, and has done much to awaken interest amongst pædiatricians in this subject. Such interest is reflected in the fact that, at

the Hospital for Sick Children, Great Ormond-street, whilst 2886 tonsillectomies were performed during 1920, during 1927 there were 3909, an increase of 34 per cent.

Indications for Tonsillectomy.—Our cases, on examination, showed either very much enlarged tonsils, or, more commonly, moderately enlarged or buried tonsils with enlarged tonsillar glands. With such clinical findings was associated a history of (*a*) nasopharyngeal affections, or (*b*) general infections (e.g., rheumatism, hæmorrhagic nephritis) or metabolic upsets (e.g., vomiting, bilious attacks), secondary to these repeated tonsillar attacks.

Method of Tonsillectomy.—All the tonsils were dissected out, the majority (i.e., cases from Great Ormond-street) being done by Mr. G. E. Waugh's method. A few had had their tonsils guillotined elsewhere previously, and along with their recurrence was a return of the symptoms. To be of any use a complete dissection of both tonsil and lingual tonsil must be made. Almost every case was kept at least one night in hospital.

Time for Tonsillectomy.—Undoubtedly the spring, summer, and autumn are the best seasons for the removal of tonsils, as the child is able, after a short convalescence indoors, to get out into the fresh air and to pick up quickly any ground lost. During the winter months, with prevailing catarrhal infections and acute infectious fevers, the operation is likely to be severely complicated.

We suggest that our investigation has demonstrated the efficacy of tonsillectomy in selected cases. 500 children, who had come to hospital complaining of various symptoms, and who were found to have septic or hypertrophied tonsils, reacted in an almost uniformly satisfactory manner to tonsillectomy and rapidly gained weight. The gain in all cases was not equal; in fact, in some cases it was small, but in no cases noted did the child actually appear harmed, and in almost every case it was greatly benefited. In a properly selected case there is no single operation in children's medicine more successful or that shows such dramatic results as that of tonsillectomy.

In those cases where convalescence was arranged, despite the unsatisfactory condition of the children before operation when they were actually losing weight, a considerably more rapid recovery was made and a greater maximum gain shown. It would be ideal if every child could have a fortnight at least at the seaside or a similar complete change after tonsillectomy. The convalescent homes throughout the British Isles, especially those under the auspices of the Invalid Children's Aid Association, are fully alive to the difficulties of making a child thrive when sent with septic tonsils. One of the questions asked on the medical certificate demanded by the Invalid Children's Aid Association is: "Does the child require attention to teeth or tonsils?" At a number of homes, when a child has been admitted with septic tonsils, the parents are asked to sanction tonsillectomy in order to prevent a waste of convalescence.

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Clinical and Laboratory Notes.

INTERLOBAR EMPYEMA.*

BY WALTER BROADBENT, M.D. CAMB., F.R.C.P. LOND.,
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THE most difficult empyemata to diagnose are those which arise in abnormal situations, such as the interlobar fissures. As there is considerable variation in the signs it may be of interest to quote a few cases.

Three Cases Described.

A gentleman, aged 30, was taken ill with a right-sided pneumonia. On the third day the left side was affected, and on the fifth he had pericarditis with friction all over the cardiac area, and a pulse of 130. After being desperately ill he slowly improved up to the *nineteenth day*, when his temperature began rising again. I saw him for the third time on the twenty-first day, his temperature having been 101° F. the two previous evenings. His right chest was moving well, though there were crepitations throughout the lower lobe, and there was still a little pericardial friction down the right edge of the sternum. The left chest moved very little. Over the apex and first space there was diminished resonance, poor rather bronchial breath sounds, and a few crepitations. In the second and third spaces weaker breathing. From the fourth space down louder breath sounds and more crepitations. On raising the right arm at right angles to the thorax there was a dull and silent area high up in the axilla about 1½ inches broad by 3 inches across, and below that crepitations. A needle put into this *dull* area revealed pus, and that afternoon a large empyema between the upper and lower lobes was drained by removal of a portion of rib high up in the axilla. The patient made an excellent recovery.

In another case the empyema, well shown by a radiogram, was between the upper and middle lobes on the right side. In that case there was actual dullness in the second and third spaces in front, with diminished resonance over the rest of the right chest. There was bronchial breathing at the apex, distant tubular breathing in the second and third spaces, below that weak breathing with coarse crepitations.

A third case was admitted under me in the 2nd Eastern General Hospital with what appeared to be a large empyema on the left side, there being dullness and silence from the spine of the scapula to the base. Major A. H. Buck operated in the usual situation, but the amount of pus was unexpectedly small, and there was no improvement in the general condition, the temperature remaining hectic. A few days later I found that the lower part of the back was slightly resonant, but just below the level of the spine of the scapula there was an area of absolute dullness about 3 inches in depth. An aspirator needle inserted here withdrew much pus which, however, reaccumulated. Major Buck then removed a portion of the fourth rib between the scapula and the vertebræ, and opened a large empyema between the upper and lower lobes of the lung. The operation was one of some difficulty owing to the depth of muscle. In this case the the original empyema was evidently interlobar, and some of pus had leaked down over the lower lobe where it was found at the first operation. The man made a good recovery.

Besides these I have diagnosed three other cases of interlobar empyema, which have been subsequently cured by operation through the upper axilla. One of these was not preceded by pneumonia, but by a fall in which the left chest was severely bruised. In another case the patient, an old man, died after operation.

Physical Signs.

When pus collects in an upper interlobar fissure there may be dullness in the second and third spaces in front, or high up in the axilla, or a band of dullness at the level of the spine of the scapula. Resonance is diminished over the lower lobe from compression and congestion. On auscultation, over the upper lobe there is weakened bronchial breathing from pressure, over any dull band very weak breath sounds sometimes tubular, and, below that, weak and rather bronchial breath sounds with crepitations. If much pus collects the lower lobe may be so compressed that it is dull and almost silent, leading to the belief that there is an ordinary empyema. Unfortunately, the physical signs differ in every case. The best place to insert a needle is in the upper axilla with the arm at right angles to the chest, since this is the seat of election for operation, there being no muscle in the way, but, if an interlobar empyema has ruptured into a bronchus, the remaining pus is always near the root of the lung, and it may be too deep to be reached by a needle from the axilla, and one may have to be used in the interscapular region or in the dull area in front.

Of empyemata between the middle and lower lobes on the right side I have only diagnosed two. In

* Being remarks made in a discussion at the Medical Society of London on Oct. 22nd. (See THE LANCET, Oct. 27th, p. 863.)

neither of them was the heart displaced to the left. The right chest was more or less dull all over. From the apex to the third space breath sounds were of rather distant bronchial character with fine crepitations. In the fourth space from the nipple out to the mid-axilla there was louder bronchial breathing with no crepitations. Below that breath sounds were much weaker, but crepitations could be elicited on deep breathing. Over the back breath sounds were bronchial down to the middle of the scapula and weak below that, but crepitations could be heard almost down to the base with a deep breath. In one a radiogram showed the right chest opaque with a lighter area from the apex to the third space, and a little light patch at the inner side of the base just above the liver. It also showed that the heart was not pushed over. I had a needle put into the fourth space in the anterior axillary line, where the bronchial breathing was loudest and where there were no crepitations. Pus was found, a portion of the fifth rib in the anterior axillary line was removed, and a large interlobar empyema was opened, the patient making a good recovery. In the other case the empyema burst into a bronchus before operation, and the patient died.

A very rare position for an empyema is between the mediastinum and the lung, the lower lobe of the lung being adherent to the chest wall. In the only case that I have seen the whole of the left lower chest was dull and silent, but the heart's apex was to the left of the nipple line. The temperature and the blood count indicated empyema. Needles in the ordinary area failed to find pus, but one just external to the angle of the eighth rib struck it. Later a piece of rib just beyond the angle was resected, and a large empyema opened which extended forward to a depth of 8 inches. It was bounded externally by the lung, which was completely adherent to the parietal pleura and collapsed.

Another rare position is between the base of the lung and the diaphragm. After a right-sided pneumonia the temperature pointed to empyema, but, though the lower half of the chest was wanting in resonance, it was not so dull as in empyema, and redux crepitations could be heard nearly to the base, but I found a dull and silent area about 3 inches broad over the lower ribs in the posterior axillary region. A needle inserted here withdrew pus, and a largish empyema was found between the lung and the diaphragm, with the lung firmly adherent to the chest wall above it. One point should be remembered in children—that breath sounds can often be heard distinctly through quite a lot of pus. If there is flat dullness it is always safer to explore.

Treatment.

As to the treatment of empyema, in the interlobar cases it is advisable to stitch the lung to the parietal pleura before opening, unless it is already adherent, and it is necessary to leave in rather a long tube to get good drainage. As mentioned before, the upper axilla is the easiest place for operation in those in the upper fissures, if pus can be obtained there, and the right anterior axillary line at the level of the nipple for one in the lower fissure.

In an ordinary empyema, especially if it is a large one, I strongly advocate aspiration one day, removing as much pus as possible, and operation the next day. This lessons shock, and gives a chance for the pleura to become adherent in the upper part and reduce the size of the cavity. It is not, however, a good thing to aspirate an interlobar one, since the larger they are the easier they are to open. Cure is much hastened if no air is allowed to enter the empyema after it has been opened. A good-sized tube should be used, not passed much into the pleural cavity, and the layers of the wound should be fixed tightly round this by purse string sutures. Strips of strapping put round the tube beyond the dressing and fixed to the skin help to keep it in position. The end of this tube is connected by a small piece of glass tubing to a long rubber tube leading to a bottle beneath the bed, or, better still, to a suction apparatus, such as that described by Dr. F. J. Poynton. If the tube should get blocked the end should be clamped by a spring clip before taking off the glass portion. Then the patient should be told to cough, the spring clip being released in the expiratory stage of the cough and put on again with the inspiratory stage. Sometimes sinus forceps may be necessary to clear the tube, and this should be followed by irrigation with eusol.

SKIN IRRITATION UNDER ULTRA-VIOLET RADIATION.

BY STANLEY VAN S. BOYD, M.R.C.S. ENG.

IN over four years' constant practice of treatment by ultra-violet radiation I have had a large number of patients who have exhibited irritation of the skin in greater or lesser degree. While in some cases this irritation has merely been provocative of humour, in many the complaint has been bitter. Guided by the reaction of the sweat, which is, of course, secreted in considerably increased amount owing to the hyperæmia induced by the rays, I have been in the habit of recommending patients who suffered from this trouble to bathe their skins with alkaline lotions. In the milder cases this was effectual. The irritation being allayed, successive doses of radiation rapidly induced such resistance in the skin that the pruritus ceased to occur.

This year I had under my care at one and the same time three patients in whom this irritation was so severe that radiation treatment had to be abandoned. I had long sought for some common factor, in complexion or texture of the skin or what not, upon which I might depend to predict the probable occurrence of this distressing complication; but the fact that neutralising the perspiration gave relief to milder cases suggested the possible value of an investigation of the alkaline reserve in the severer ones. The results of these inquiries are to be seen in Table I. All of these estimations, and those reported in Table II., were carried out for me by the

TABLE I.

Case.	Serum.	Urine analyses.			
	CO_2 absorption.	(1) Litmus.	(2) Titration against N/10, NaOH.	(3) pH.	(4) NH_3:urea-N. ratio.
	Per cent.				
1	52	(a) Acid.	60	6·5	1:25
		(b) Alk.	12	7·6	1:35
2	50	(a) Acid.	60	5·3	1:15
		(b) Alk.	8	7·9	1:53
3	45	(a) Acid.	91	5·05	1:16
		(b) Alk.	9	7·7	1:36
Normals ..	50–75		20–40	5·5–6·5	1:15–1:25

(a) = 24-hour specimen.
(b) = Alkaline tolerance test—i.e., 1½ hours after feeding 5 g. $NaHCO_3$.

TABLE II.

Case 3.	Urine analyses during fast.			
	(1)	(2)	(3)	(4)
24-hour specimen ..	Acid.	91	5·05	1:16
After alkaline T.T. ..	Alkaline.	9	7·7	1:36
" 72 hours' fast	Acid.	68·8	5·51	1:14
" 120 "	"	62·8	5·1	1:15
" 240 "	"	49·2	5·35	1:2
" 324 "	"	39·6	5·91	1:1·6

Harrogate Clinical Laboratory, and I wish to acknowledge my indebtedness to Dr. F. B. Smith for his invaluable assistance in this matter.

It will be seen that all the evidence in these cases pointed to the existence of a functional depletion of the alkaline reserve. The absorption power of the blood for carbonic acid was either below or at the low limit of normal. All the urines were highly acid to litmus, and when titrated against deci-normal sodium hydrate—evidence which was supported by the pH value. The *ammonia-urea-nitrogen ratio* was estimated as an indication of the proportion of total acidity which might be attributed to amino-acids. An alkaline tolerance test was undertaken so that any condition of true acidosis, as opposed to functional variations, might be revealed.

Case 1.—The patient was placed upon a course of alkalising medication, and although the period of testing unfortunately could not be prolonged, very considerable increase of tolerance of ultra-violet radiation was observed. Before alkalisation, a dose of 20 seconds, from which all rays shorter than 2900 Angström units had been filtered, had produced an irritation so severe as to bring on a syncopal attack; while afterwards an unfiltered dose from the same lamp of 45 seconds produced no irritation whatever.

Case 2 proved very different. Up to seven years ago there was no sensitiveness to strong sunlight at all. The patient then had an operation for the removal of the appendix, and a further one for mammary abscess. Immediately after this she observed that the least exposure to sunlight produced a papular rash with severe irritation. She had been to London, where her physician clearly considered her's might be a case of food allergy. She was first placed on a short fast, and then fed on single articles of diet, in order to discover to what foods, if any, she had become sensitised. At the same time, intravenous peptone injections were given, and these appeared to her to do her more good than anything. Her relief had been, I found, only temporary.

When I first saw her I found she had herself observed that a bruise would produce a purely local manifestation of the rash: and also that an immersion of her feet in sea water had given her a similar result wherever the sea water had bathed the skin. Alkalisation proving ineffectual, some of her serum was incubated with peptone-agar, after the method recommended by A. G. Auld for asthma. She had increasing doses of this serum over a period of three months, and though able to take ultra-violet light better than before her treatment, I regret to have to report that she retains apparently in full her sensitiveness to sunlight.

Case 3 was that of a patient who consulted me regarding rheumatic pains in the neck, shoulders, back, and knees, and whom I found to be showing nodular fibrous thickenings in the areas affected. A course of autogenous vaccine had been given her without much benefit. As we frequently find that such patients may prove responsive to their vaccine after a course of radiation, I attempted this treatment, but the itching was so severe that I had to desist. I found on inquiry that for five years there had been severe irritation of the skin on exposure to the air immediately after the daily bath, and this had been so severe that at times relief was sought by the use of aspirin.

I recommended a period of auto-nutrition, with colonic lavage, and estimations of the urine were made from time to time. This treatment is instituted so that while being fed on nothing but water, the body may have an opportunity of selecting the amounts of the various food elements required for the metabolism from the storage depôts, and because it has been found that under these conditions abnormal deposits, such as fibrositic nodules, are absorbed or dispersed most rapidly. The fast in this instance lasted for 324 hours, and, as will be seen from the summary shown in Table II., the acidity of the urine steadily decreased from 91 to 39·6.

Both purposes of the treatment were attained. The rheumatic pains were completely relieved, and the patient was able to take ultra-violet radiation without irritation. Incidentally the after-bath trouble disappeared also.

The practical result of this inquiry has been that a routine examination of the urine is made before treatment is undertaken, and in such cases as show marked acidity I prescribe an alkaline mixture, and, if possible, increased exercise in the open air (this, by augmenting ventilation, induces an increased CO_2 excretion), in order to prevent such irritation as might arise from deficient alkaline reserve.

Harrogate.

Medical Societies.

A CONGRESS OF RADIOLOGY

THE British Institute of Radiology, incorporated with the Rontgen Society, arranged a congress on radiology for Nov. 14th–17th. On Friday, the 16th, the subject of discussion, under the chairmanship of Sir HUMPHRY ROLLESTON, was

THE VALUE OF THE OPAQUE MEAL IN DIAGNOSIS.

Sir THOMAS HORDER maintained that despite the inestimable contribution of X rays to diagnosis clinical medicine still had a legitimate sphere of action, and that to parcel out the patient among radiologists, bacteriologists, and biochemists was not to do the best possible thing for him. Patients were coming to believe that there was a difference in essential value between facts elicited by instrumental and by clinical investigation. The only difference was, in reality, in the degree of facts, in their interpretation, and in their relation to other facts. The crux of the decision lay in determining what was and what was not pertinent to the main issue. The great art of diagnosis did not lie in the accumulation of a vast quantity of data, nor in establishing a superiority for one set of data obtained by one particular method, but in taking a survey of all data and selecting the essentials. The contribution made by radiology towards the diagnosis of alimentary disease had been quite incalculable, and would be even greater if the standard of radiograms were raised. Numbers of indifferent radiograms might well be exchanged for one or two good ones, and greater care should be exercised in selecting cases for opaque meal examinations. Partial investigations should be rare; the number of fallacies increased with every limit imposed upon the examination. It was by no means true that the better the radiogram the easier the interpretation; the contrary was the case. As finer and finer variations were demonstrated the meaning of the observations became wider and demanded the utmost forbearance in its reading. Far better be afraid to "rush in" than be afraid to forbear. Radiologists should beware of theorising in their reports; what the clinician asked of them was an opinion on the present state of the patient.

Spasm of the œsophagus might be so chronic and tight as to appear malignant when it was not, and the most skilful technician might fail to get a bougie through under deep anæsthesia. A routine investigation of an opaque meal should always include watching the bolus from the pharynx to the stomach, or a cardiac growth might be overlooked. Localised and extraordinarily persistent spasm was also common in the stomach and duodenum and was often functional; the terms "hour-glass," "cascade," or "cup and spill" carried with them fixed notions which too quickly determined the report. Radiologists could give the greatest help of all in carcinoma; clinicians wanted the earliest possible suggestion—lessened motility, deformity in peristaltic wave, and so on—and could not afford to wait for proof. The radiological picture was not of great significance in visceroptosis; it was unhealthy functioning and not faulty position that underlay symptoms. He questioned whether reports claiming to diagnose "colitis," "gastritis," or "abnormality of the mucosa" did not strain the method past its present possibilities and do it a disservice. Delay in emptying was no more proof of disease than variation in length and calibre. Radiology helped very little with diseases of the appendix, chiefly because of its complex pathology.

Radiology and the Surgeon.

Mr. A. J. WALTON recounted the help he had gained from radiology and emphasised the importance of the radiologist. The most modern equipment was useless in the hands of an untrained man. Too often,

also, cases were sent for X ray when the most superficial clinical examination would have made it clear that such an investigation was unnecessary. A second fault was that doubtful cases were provided only with one poor film, unaccompanied by a report, which was not only useless but positively dangerous, as it caused wrong diagnosis and a false sense of security. A careful investigation by a well-trained man and accompanied by a detailed report was of inestimable value and almost essential to diagnosis. The report must be regarded only as one piece of evidence among many, and should include a detailed account of findings as well as the conclusion. The surgeon, also, should let the radiologist know his observations. The films were of secondary value often to the screen findings; a film was a single photograph of a cinematograph performance—a fact which was often forgotten by the lay and medical public. Diagnostic difficulties were probably only temporary, and the majority of them to-day only arose when the investigator was relatively unskilled.

In gastric ulcer the history would give a 90 per cent. accurate diagnosis while radiology also gave 90 per cent. accurate results; the two did not exactly correspond, so that between the two methods a very small doubtful percentage remained. Great difficulties in diagnosis were encountered in visceroptosis in women, simulating ulcer; gastritis in middle-aged men simulating carcinoma; chronic pancreatitis simulating ulcer or cancer; penetrating ulcer of the lesser curvature and carcinoma of the stomach. In these cases coöperation between surgeon and radiologist was of immense value. Of great importance also was radiological investigation of the rest of the body, for chronic pulmonary tuberculosis might simulate gastric ulcer. The clinical history of duodenal ulcer was usually definite, but gall-stones might simulate it and require radiology for their differentiation. In the future, X rays would be most helpful in determining whether the ulcer should be treated medically or surgically. If there were only slight irregularity of the cap or hyperperistalsis, the ulcer might be more of the nature of an acute erosion and susceptible to medical measures. The scarring of an old ulcer might give appearances indistinguishable from those of active ulceration. The frequency of duodenal diverticulum was not fully recognised, but the X ray picture was unmistakable. Superficial gastro-jejunal ulcer could not always be distinguished from the irregularity of an anastomotic opening, but radiology was of great value in confirming a diagnosis. Distinct obstructions in the small intestine might be clearly revealed. Entry of the barium meal into the appendix and changes in mobility might indicate degenerative rather than inflammatory changes. On the whole, the value of the opaque meal depended entirely upon the investigator and on the degree of coöperation between radiologist and clinician.

The Radiologist's Point of View.

Dr. A. E. BARCLAY said that surgery and radiology must progress hand in hand, and there was still plenty of room for increased accuracy in diagnosis and treatment. The classical symptoms of disease known to Osler had been for the most part swept aside in the realisation that a defect in one section often showed its first symptoms in some quite distant part of the abdomen. Many gastric conditions differentiated 25 years ago were no longer recognisable as clinical entities, and their exciting cause was seldom in the stomach itself. Gastro-intestinal symptoms were perverse and unreliable guides to facts within the abdomen, and the surgeon would accept the opinion of an expert radiologist against the clinical signs. No elaboration of apparatus and no perfection of technique alone, however, would give accurate results. The man behind the gun made all the difference. Those in authority had not realised the vital importance of obtaining the services of the best men for this specialised work. Those who had taken the diploma course should be saved from many errors that pioneers had made. If clinical, radiological, and operative diagnosis were compared it would be found that the two latter were far more often in agreement than the two former. Sometimes the radiologist was blamed for not having reported an ulcer or neoplasm found at operation months after he had made his examination; every X ray of an ulcer case might well be labelled "valid for three weeks only." X rays had shown how different were the living conditions in the alimentary tract from those of the post-mortem room, and that tone was closely associated with the emotions and with general health. The change brought about by radiology was exemplified most clearly in the diagnosis of œsophageal conditions, of which the symptoms and signs were misleading, and the only previous diagnostic aid had been the blind barbaric bougie. With the exception of adhesions and a few rarities, X rays of the stomach revealed only two pathological conditions—ulceration and malignancy—and had shown that in earlier days the stomach had often been unjustly blamed for conditions which had their origin in other organs. The patient radiologist could now detect the smallest lesions, and only those in the pyloric antrum escaped his investigation. The duodenum had been shown to be the seat of ulceration as prevalent as that of the stomach, but in many cases the clinical picture did not correspond with the radiological. Definite diagnosis should be confined to cases where the crater had been demonstrated—a tedious and skilled business. Lesions of the small intestine were rare, but the clinical signs were so vague that a diagnosis was quite impossible and the radiologist alone could give the clue to site and obstructive nature before acute symptoms prejudiced the chance of operative success. Radiological diagnosis might be better with the old semi-solid meal than the modern fluid one, which was less readily obstructed. For appendicular examination a fixed routine was supremely important. The three points in identifying a chronically inflamed appendix were ileal stasis, fixation on careful manipulation, and pain on pressure over the appendix. In palpation the radiologist alone could be certain of putting his finger straight on the right spot before the patient had time to resist. In acute or semi-acute appendicular trouble there might be no shadow in the terminal ileum after five hours, but a fair shadow in the ascending colon, and perhaps beyond. If an appendix retained the opaque salt days after the cæcum had emptied, it was obviously not doing its duty. Taken all in all, the radiological diagnosis of appendix trouble was vastly more reliable than the clinical.

The signs of growth in the large intestine were obstruction, fixation on palpation, and filling defect, and workers were apt to rely too much on the first. In the absence of spasm quite large growths might be missed. Sources of error in the detection of a filling defect were partial filling and scybala not impregnated with the salt. Diagnoses of colitis should be very rarely given in the absence of Crane's "string sign" and a few other fairly definite appearances. Diverticulitis, however, was usually obvious.

The diagnosis of lesions of the large intestine was the least satisfactory of all, but on the whole so valuable was the information obtainable that the clinician who did not use the opaque meal was as negligent as a mariner who set out without a compass. The work should be done by a specialist who had had wide previous experience of medicine and pathology and with time to examine and re-examine. Good X ray work was expensive and valuable; cheap work had brought much unnecessary discredit on the method.

Discussion.

Dr. H. E. GAMLEN emphasised the importance of having a qualified radiologist, and said the diploma should be made more difficult and should include adequate knowledge of radium and of pathology, and candidates should give evidence that they had followed up cases from beginning to end. Clinicians made matters very difficult for the radiologist by sending him no information and not telling him the after-history of the cases.

Dr. GILBERT SCOTT said the radiologist must use to the full his clinical and radiological experience, powers of deduction and sound judgment; he was a diagnostician and not a technician. He described the contrast between early opaque meals and modern technique, whereby a detailed examination of the stomach could be made in five minutes with a 90 per cent. accuracy. Diagnosis was now based on direct evidence, and the photograph was now used more as a record than a diagnostic aid in a mobile organ like the stomach. The lesion was detected by manipulation on the screen; about 3 oz. of a palatable mixture was first given and smeared all over the stomach by means of a hand on the abdomen. This revealed the antero-posterior wall, which the full meal examination did not. Differences in radiological and surgical findings were more often due to the radiologist "finding" a lesion and the surgeon failing to find it than vice versa; this was an error of the inexperienced radiologist who took normal variations for pathological lesions.

Dr. L. A. ROWDEN said that his diagnoses were made as much on his clinical examination as on his X rays. He never took more than one patient in one day for an opaque meal, and the investigation lasted from 10 A.M. to 5 P.M. He began by screening the whole body, then passed on to the Scott-Barclay gastric examination, then to painting the duodenum, and then to the full meal and the follow-through. His meal was palatable, wholesome, and nourishing, and he never used barium.

Dr. G. E. VILVANDRÉ said he had learned much in the theatre and post-mortem room. Screen examination was invaluable, but good plates at frequent intervals were also necessary to reveal small carcinomata. The eye could miss things which the photograph fixed. The indefinite "chronic appendix" could be diagnosed by X rays; tenderness, concretions, fixation, and calcified glands were all useful diagnostic points. Many "silent regions" should not be silent, but the sigmoid was a very difficult part to examine and a button-like early growth would not show on the screen. Therefore any small abnormality should be pointed out and investigated by sigmoidoscopy. The same applied to the œsophagus.

Dr. J. R. WYLIE gave statistics of the 364 barium meals administered at the Miller General Hospital during this year. Seventy-five gastro-duodenal cases had subsequently been operated upon; 23 had proved to have gastric ulcer, 29 duodenal ulcer, 8 carcinoma, 2 gastric and duodenal ulcer, and 1 adhesions, giving a percentage of organic lesions of 98 and of absolute accuracy of 88.

Dr. G. B. BATTEN said that when surgeon and radiologist differed about the presence of a duodenal ulcer he believed the latter. He thought there was a happy mean between Dr. Rowden's lengthy technique and the rapid American style where every possible lesion had been tabulated and numbered and 66 barium meal investigations were made in an afternoon. There was a danger of causing hæmorrhage if ulcers were too freely manipulated.

Dr. R. C. RODGERS said that many cases sent up as gastric or duodenal ulceration turned out to be chronic appendicitis. If there was delay in the cæcum he gave an enema, and if the cæcum was found empty with two or three dots round about it the appendix was usually pathological; his percentage of accurate diagnoses had been fairly high.

Mr. P. T. CRYMBLE said that the radiologist of the future would be an expert gross pathologist. Surgical findings must not be taken as scientific fact. Many ulcers were now found in the second part of the duodenum, though formerly they were believed to be rare in this portion, and multiple ulcers were more common than single. He had had some help from emptying-rates; a seven-hour gastric retention persisting for some months justified laparotomy.

Dr. JOHN MUIR said that it was very difficult to evaluate this method on percentages, as so many cases did not come to operation. The value depended entirely on the impression given to the clinician; therefore reports should be carefully sent up. Radiologists were specialists and should stick to their specialty; it was for the clinician to ask questions and make the diagnosis. He had collected from the literature 15 radiological signs of appendicular disorder and 12 of them were absolutely worthless, although repeatedly quoted. He asked for contributions to form a pathological teaching museum for students of radiology, so that the museum specimen and the X ray photograph could be displayed side by side.

Dr. STANLEY MELVILLE said that the clinician was apt to forget that the radiologist was talking only in terms of shadows. After five weeks' alkali treatment an ulcer would disappear, but that was no justification for stating that the ulcer was healed. It was for the clinician to say when a lesion was healed; the radiologist merely reported that at a given time there was no radiological sign of ulceration and that was where his business ended—or ought to end.

Mr. WALTON, replying, commented on the remarkable agreement manifested throughout the discussion; criticism lay not against radiologists, but against the public interpretation of radiology. Ludicrous statements were made by people who produced and relied on single films. There was no discussion on the value of radiology properly carried out. Of all silent areas the rectum was the most silent and must not be forgotten. It was most essential that some senior person should decide which cases were to be sent for X ray examination.

Dr. BARCLAY also replied.

PUBLIC HEALTH CONGRESS.

LONDON, NOV. 19TH–24TH.

BRITISH municipal associations met in congress on public health administration this week at the Agricultural Hall, London. The first act was the formal opening of the exhibition by Mr. NEVILLE CHAMBERLAIN, Minister of Health. After Sir FREDERICK WILLIS, chairman of the organising committee, had explained the origin of the Congress as an offshoot from the Congress and Exhibition of Public Works, which had become too occupied with roads to deal faithfully with the public health aspect of its duties, Mr. CHAMBERLAIN spoke of the value of the exhibition to exhibitors and visitors alike, enabling them to compare notes on what the manufacturers had to offer to local authorities engaged in public health work and what the local authorities needed. He illustrated by statistics the wonderful work of public health measures in maintaining an increasing population of the country despite the enormous decrease in birth-rate. Some people deplored an increasing population, but he believed warmly in the British race, and thought the more there was of it the better. He outlined the proposed reform in the poor-law and the greatly increased responsibility and power thereby given to local authorities for assisting the public health.

In the afternoon Sir ARTHUR STANLEY presided, when Sir GEORGE NEWMAN gave an address on

The Purpose of the Public Health Service.

Its purpose, he said, was continually changing, and there had been a public health purpose before there had been a public health service. Its object had been to prevent "famine-pestilences," which were traced to unsuitable food and the nuisances consequent upon the flooded state of the country. The solution, therefore, had been more and better food and drainage. The first stage in the development of the public health service had been land drainage and agriculture which, although a thousand years old, was an ever-new problem. The next stage had been one of opposing by regulations, as far as possible, the diseases known as "leprosy" and "the plague." Leprosy was the first disease against which a by-law had been passed

in England, and the first Sanitary Act had been directed against the plague. At this time arose the "Commissioners of Sewers"—a position which had been Sir Thomas More's first public appointment. In the seventeenth and eighteenth centuries small-pox, typhoid, influenza, and cholera had directed the purpose of the public health services towards the channels of infection—the environmental factor. The study of typhoid had led to the establishment of adequate water-supplies. In our own period—the "golden age of bacteriology" introduced by Pasteur and Koch—the centre of gravity had moved from channels to causes, from the environment to personal hygiene. Between 1870 and 1910 no less than 20 great diseases had been traced back to their organismal cause. The two great fundamental purposes of all public health work must be the improvement of the environment of man and the care of his personal bodily health. England had unquestionably the most complete and comprehensive public health service that there had ever been, and the State intervened on this enormous scale because it had now been realised that the purpose of that service was no less than the survival of man and the increase of his capacity. Nations which had disregarded the communal health were not here to give evidence. No single factor had changed the lives of races more than disease. Unless man conquered disease, disease would conquer man. Last year England had saved 37,000 babies over and above the average number saved in 1910, thus proving that life could be saved hand over fist. Not only were lives saved but also man was being taught how to live a physiological life. This amazing triumph had come about largely because medical science had captured for its own use a great many non-medical agencies and powers. The speaker instanced the thermometer, steam for steam-disinfection, the prism and ultra-violet rays, analgesic drugs and anæsthesia, Liebig's work and proprietary synthetic foods, photography, the internal-combustion engine, X rays, and radium. It had captured also the social life of the people; health was the most popular subject of government and was "news." Rapid communications enabled us to transmute scientific discovery so that it became the property of every man, woman, and child. One thing not exhibited was the National Health Insurance, a service based on the guild system of the ninth century. He quoted details of the expenditure on social service, which in 1901 was 31 million pounds and in 1926 was 308 million—figures unprecedented in the history of the world.

At the morning session on Nov. 20th the subject of discussion was

Research in Relation to Public Health.

Sir ARTHUR ROBINSON took the chair and spoke of the importance of the research worker in all the problems of public health, and of the great and immediate interest of the State in research.

Sir WALTER FLETCHER described the steady evolution of public health policy from negative morality, "Thou shalt not," to positive morality, "Thou shalt"; from punitive codes to a great constructive policy of service, from opportunism to the principle of maintaining and developing all the conditions of life which made for health and efficiency. That progress, he said, had been due to the steady application of science as science had developed. The public health official was performing an art because he was dealing with human beings; before he could get the public with him he had to be not only the exponent but also the interpreter of science. There was no simple relationship between research and its application in public health work; there must be a lag, due partly to deficiencies of interpretation, partly to imperfections of the machinery of Parliament, the vehemencies and exigencies of party, partly to social customs and prejudices and the efforts of cranks, and partly at times to physical fear. Fear, indeed, often accelerated reforms, as it had at the time of the two cholera epidemics in 1848 and 1866, when the first Public Health Act and the Sanitary Act had been saved from almost certain disaster by the outbreak of disease.

The first branch of science to shape and model public health policy had been bacteriology; all the great triumphs of modern public health were dependent on patient and unseen laboratory work. They were now supposed to be the obvious operations of common sense, but the common sense of to-day was the laboratory discovery of yesterday. The application of bacteriology had perhaps gone too far in some directions, for instance, in terminal disinfection and in some of the modern rigour of plumbing requirements. In other directions it had not gone far enough. The milk-supply was an instance where, if the public could only have realised the extent of the evil, they would have made it a chief political issue. The story was a discreditable one, however told; political difficulties and other matters had long delayed the great boon of clean milk that bacteriology had to offer. There were curious local differences in the way the resources of science were applied. Protection and immunisation against diphtheria were greedily applied in one great city and almost untouched in another. In too many directions, moreover, bacteriological science had no help to give, for instance, in virus diseases.

Other sciences also had developed, notably physiology. While this country had conspicuously applied the work of foreign bacteriologists, it was equally conspicuous for producing physiologists and neglecting the applications of their science. The industrial revolution had brought human bodies into constant contact with restless machinery, and the opportunity to help their adaptation had been neglected. Even now some people would take the utmost trouble to care for dead machinery and neglect the care of the human machine. The neglect of science in the great controversy about hours of labour had been pathetic; it had never occurred to either side that shortened hours meant greater output, and that a simple experiment would have shown that both sides could have what they wanted. The demands of war had found no coherent body of knowledge applicable to the problem, but out of the hasty improvisions of that time the Industrial Fatigue Research Board had been born. A most interesting application of physiology had been the astonishing revolution in the health of women with modern dress and habits, so that chlorosis had disappeared. Another great industrialisation of rural populations was taking place—in India and Africa—and this country had a great responsibility to see that this movement was not mismanaged as our own had been—a responsibility that could only be fulfilled in the full light of science.

Nutrition and Diet.

Aggregation in cities had brought about an immense change in the food of the people, and developments in transport and preservation had brought obvious benefits and evils. The chief evil was the dangerous loss of essential food values not to be detected by the ordinary person. The matter was of overwhelming importance and—if choice must be made—should take precedence of housing. The public health officer was empowered to condemn unfit food, but science was calling out for the application of a constructive policy of definite nutritional guidance, for a city physiologist as well as a city bacteriologist. In dietetic improvement lay the hope of remedying the deeply disquieting condition of the national physique, fitness, and beauty, which was the proper test of all public health work. The reduction of infant mortality and the prolongation of life would only lead to a reduced youthful working population supporting a greatly increased elderly population. The country did not need old men, either in war or in peace. The proper test of a country was the number of vigorous young men and women able to do its work. No one could walk through an industrial town or a football crowd without a sinking of the heart, and recent recruiting figures were most ominous. Undoubtedly there were two standards of physique

in the country; the stunted industrial type and the athletic undergraduate type. Neither birth, wealth, nor housing accounted for this difference; as the late Garter King at Arms had said, "the whole of the nation is an aristocracy by blood." The inheritance of the elder son only had prevented any deep social cleavage. Dr. Corry Mann's work, confirmed by others, had shown that this difference in physique was purely a question of food, not of quantity but of quality. The men of bad physique made slums, and any slum clearance that did not improve physique would be expensive, temporary, and palliative.

At the afternoon session Dr. C. HUBERT BOND read a paper on

Local Organisation for the Prevention and Treatment of Mental Disorders.

He set out to show that for many persons suffering from mental illness there was no available treatment, and that for many others available treatment was rendered unsuitable by archaic procedure. He pointed out that of the 20,000 persons who annually came under official cognisance on account of mental disorder a great number had to work out their own salvation, enduring a feeling of inferiority aptly described by the French word *défaillance*. After giving nine examples of cases for which there was at present no treatment available, the speaker emphasised the importance of seizing the "psychological moment," and went on to consider the facilities required for voluntary treatment of incipient mental illness. Undoubtedly, he said, the out-patient department of the general hospital was the best nucleus for a clinic. Patients would go there more readily, and there was every opportunity there for the essential physical investigation. A doctor could probably not do justice to more than five patients in a half-day clinic. The staff of mental hospitals should be large enough for the senior members to spend at least half a day each week in the out-patient department of a general hospital. Beds should be provided for elaborate physical examinations and to remove patients from domestic worries; at present only one general hsopital in the country had beds for mental cases. The present state of the law was a serious obstacle to treatment of the incipient case as well as to early treatment of the case for which treatment facilities were available. Dr. Bond gave eight examples where certification was undesirable and unnecessary, and acted as a bar to efficient treatment. These included puerperal insanity, benign stupor after shock, severe delirium tremens, and senile dementia. None of these possessed volition, but none either assented to or refused treatment; all were heedless, indifferent, and free from any grievance at "infringement of liberty." Florence Nightingale had sagely remarked, "It may sound a strange provision to insist, as the first requirement in a hospital, that it should do the sick no harm."

For the mentally disordered patient who was antagonistic to treatment there was adequate provision; they were the smallest group and were by no means irrecoverable. It would be disastrous if the mental hospital became entirely or even mainly concerned with the reception of the "unwilling" patient. There had grown up a very grave abuse of the "urgency" order, so that mental patients were compelled to endure the stress of an interim reception at the poor-law institution instead of being sent straight from their homes.

After outlining and discussing the recommendations of the Royal Commission, 1924, Dr. Bond proposed a scheme of local organisation. Institutions—mental hospitals and colonies for defectives—would be the pivot, belonging to the local authority and governed by "mental health committees," of which there should be one only to deal both with mental defect and mental disorder. The committees should have women members and should arrange for out-patient clinics at the local hospitals and for reciprocity between hospitals, universities, and mental institutions. The chairman and vice-chairman should be ex-officio members of the public health committee, and there should be members from the public health and education committees on the mental health committee. That committee must have a medical officer—the superintendent of the nearest institution or the lecturer in psychological medicine at the nearest university—and if more than one such authority were available it would be wisest to appoint a special officer distinct from all of them. An important activity would be the medical organisation of school-children from the psychological aspect. The medical staff of the mental institution should have every facility for keeping in touch with the general body of the profession and with recent advances, and the same fluidity of service should be available for mental nurses. Nurses should be allowed periods at convalescent homes, poor-law institutions, or even in private houses. Municipal hospitals might be used as auxiliary units to mental hospitals, or for cases of senile dementia. The general hospital unit should treat neuroses, psychoneuroses, and threatened relapses, and should examine periodically mental defectives, abnormal children and delinquents, and provide a place for interviewing patients absent on trial from mental hospitals. "Boarding out" should be exercised more extensively, and an official should be appointed to do the work now done by the relieving officer in connexion with mental disorder. Health visitors should be of two kinds—those able to supply just the information the staff required about the patient's home, &c., and those who could supply the patient with the information he needed about employment and home conditions when he was discharged, and who were experienced in after-care work. The sympathetic coöperation of the general practitioner was essential to the scheme.

MEDICINE AND THE LAW.

Parent's Refusal to Allow Operation on Child.

FAILURE to provide adequate medical aid is specially mentioned in Section 12 of the Children Act as one of the methods in which a parent may commit the offence of wilfully neglecting a child in a manner likely to cause injury to the child's health. A father was recently charged at Wolverhampton under the section for refusing to permit an operation for enlarged tonsils. The evidence was that the child, a little girl of 6, was at present suffering from deafness and thickened speech, and that her state of health retarded her education. Three school medical officers gave evidence, and the head mistress of the school said that the child was very intelligent, but, because of her state of health, had to be given individual tuition. The father said he was afraid of the possibly fatal results of an operation; he wanted the child to go to an institute where, he said, she could be cured without surgery. He argued that the statutory words, "medical treatment," did not include surgical operations. The justices found the charge proved, but adjourned the case for a month with the intimation that the penalty would depend on the father's action in the meantime.

It is, of course, too late to argue that "medical treatment" in Section 12 excludes surgical operation. In Oakey v. Jackson ([1914] 1 K.B. 216) the Melton Mowbray justices, who had thought a father could not be convicted for refusing to permit a surgical operation for the removal of adenoids, were corrected by the judges of the King's Bench Division. Mr. Justice Darling then pointed out that the section mentions "loss of sight" as one of the forms of "injury to health," and that this reference showed clearly that Parliament contemplated cases in which a parent would be bound to allow his child to undergo an operation. In Jackson's case the justices, though at first reluctant to convict, did find as a fact that the child was suffering injury to her health from the adenoids, and that the only possible remedy was a surgical operation for their removal. This finding

as all-important. "A refusal to allow an opera-on," said Darling, J., "is not necessarily such a lure to provide adequate medical aid as to amount wilful neglect causing injury to health." It is vays a question of fact, and the justices have to ke into consideration the nature of the operation d the reasonableness of the parent's refusal. One ment for them to consider, added Mr. Justice ory, "is whether the person who advises the opera-n is a qualified medical practitioner or merely me irresponsible person."

Powders for Cancer.

At an inquest at Exmouth Mr. Tweed, the coroner the Honiton district, had before him evidence at a man of 75 who had died of cancer had been eated by an unqualified practitioner, Mr. Raphael oche, of Harley-gardens, Kensington.

'Mr. Roche," said the coroner, "is a well-known man d has been consulted by a great many well-known people; great many tributes have been paid to his skill, and one not but think they are genuine. One cannot shut one's es to the fact that in many cases cures have been made persons outside the medical profession; I think it unwise assume that all treatment outside the profession is to be rked at or regarded as nonsensical. I think Mr. Roche s made out a case that he has effected remarkable es."

e evidence, summarised in the *Times* of Nov. 13th, s as follows. The deceased's daughter said her her consulted Mr. Roche in London last September; r father was charged 15 guineas for the consulta-n and some medicine. The following day there ived at Exmouth by post two packets of powder. Oct. 24th, about four hours after taking the wders, her father became very sick and further ses of medicine were followed by sickness. The alyst's certificate showed that the powders con-ned no poison: "they consisted of a basis of cane gar, to which I was unable to find that anything d been added." Mr. Roche said nothing could be und by chemistry or spectrum analysis in any of e drugs he made; he used drugs in an entirely vel way upon which he had offered to lecture to e Medical Council or the College of Physicians, but offer had not been accepted; his method was to e drugs in non-tangible quantities; the powders ntained phosphorus "which could be revealed only the study of the vital force itself." Before he ok patients, he required them to sign a form declar-that they knew him to be an unqualified man, d that no legally qualified doctor whom they had nsulted had been able to cure them. Dr. Walker, Exmouth, who had attended the deceased, said patient suffered from cancer and could not have ed four or five months. Counsel for Mr. Roche essed Dr. Walker in cross-examination with regard his having recommended the analysis of the wders. Dr. Walker drew Mr. Roche's attention the difficult position of a qualified practitioner o knowingly signs a death certificate where the ceased has been treated by an unqualified man. e coroner recorded a verdict that death was due a malignant growth in the stomach which caused ernal hæmorrhage. Since the inquest interviews h Mr. Roche have appeared in more than one ndon newspaper. To one interviewer he is reported have shown—with an unprofessional disregard of oath of Hippocrates—"a long list of patients, luding dukes and earls, and even members of the dical profession." The Honiton coroner is satis-d that he has "effected remarkable cures." It st have been difficult to judge of the nature and cess of Mr. Roche's treatment from the evidence the Exmouth case alone.

RADIUM FOR HOSPITALS.—Westminster Hospital is nding £20,000 upon the purchase of further supplies of lium. The Edmonton Board of Guardians are pur-asing half a gramme at a cost of £6000 for use in their rth Middlesex Hospital, which is to be constituted a lium centre for the whole of the county of Middlesex.

Reviews and Notices of Books.

PSYCHOLOGICAL CARE OF INFANT AND CHILD.

By Prof. JOHN B. WATSON and ROSALIE WATSON. London: George Allen and Unwin, Ltd. 1928. Pp. 153. 5*s*.

HAVING won undoubted victories for the behaviourist psychology in the laboratory, Prof. Watson carries the battle into the nursery, and like an invader seeks to impose his order on the conquered territory. Here he has joined hands with Pavlov, whose views must undoubtedly cause a radical change in all future psychological orientation. What Freud has done in the consulting-rooms to unravel or de-condition the minds of his neurotic patients, Watson attempts to do, however, in a prophylactic way in the nursery. That is to say, he seeks to educate parents and nurses in the new objective psychology by showing them that all errors in behaviour are due to the mal-conditioning of a very small number of instinctive-reflex activities. Our behaviour, he holds, is nothing more than the building up of complicated reflex patterns on a few simple inherited themes. By eliminating all extraneous stimuli, by concentrating upon manipulative activities we can turn out useful children socially orderly, clean, and obedient in the best behaviouristic sense. Motherhood, paternity, and nursing thus become scientific crafts with reflex machines to work upon. Knowing what sort of citizens we wish to produce—that is, what behaviour we ask of them—we can produce them almost at will. Thus from the scientific cash register the change will be produced with unfailing fidelity and the reflex child of the future, well-conditioned, will arise to build the new Robot Jerusalem.

It is beyond debate that Prof. Watson deserves credit for introducing scientific methods into psychology and for his application of the neurophysiology of Pavlov to the study of human behaviour. But the fact remains that although much that he says is true, much that he leaves unsaid is equally true. His conception of human psychology has the very limitations which laboratory methods impose, and to suppose that what has been revealed to him in the laboratory is the total of human action is to claim an omnipotence that no scientific method deserves. While the problem of cell life—in metabolism and reacting—still remains a subject for research and discussion, views on human behaviour will have to be debated on a wider fields than the behaviouristic. In the behaviourists' world the guiding power bears a striking resemblance to Ivan Petrovitch Pavlov, and the mothers of men are replaced by an iron cow from whose cold udders the child draws his first sustenance. In the real world, however, people will continue to feel that although science will teach them a great deal about their body as an instrument, life itself is too big to be crammed into a reflex machine.

With a consciousness of these limitations we can still recommend this attractively written book. The student of psychology will accept its practical value, and parents will read between the lines, while oblivious of their fate the little Robots play.

THORACIC SURGERY.

Die Chirurgie. Edited by M. KIRSCHNER and O. NORDMANN. Berlin: Urban and Schwarzenberg. Lieferung 18, pp. 273. M.21. Lieferung 20, pp. 189. M.19. (Band IV. Teil 2.)

THESE two volumes are devoted to the thorax, but do not include the surgery of the œsophagus or heart. They contain a series of articles by different authors, profusely illustrated, and give an excellent epitome of the surgery of the air passages, of the pleura, of the lungs, and of the chest wall. The good quality of the work as a whole emphasises certain defects. There are hardly any references to work outside

Germany and Austria; recent instructive work in America, such as that of the Empyema Commission, is ignored. Indeed, in certain articles very little attention is paid to recent work; among the long list of references at the end of the article on pleurisy and empyema, for example, three only are more recent than 1921.

In the first volume the opening chapter, Die Chirurgie der Lunge, by A. W. Meyer, deals adequately with the anatomy of the thorax; the physiology and pathology of respiration; differential pressure forms of apparatus with numerous illustrations of the early types of "Ueberdruck-Apparat," and a comparatively brief section on insufflation. At the end only there is a brief account of the principles of technique for pleurotomy, pneumotomy, and for suture of the lung and bronchi. The title of the chapter is therefore somewhat misleading. The next two chapters are on Foreign Bodies in the Bronchi and on "Tracheo-bronchoscopie," by H. Frenzel. These give detailed accounts of the instruments and the methods of using them, and are most complete in this respect. In the former no account is given of the method of extraction of a foreign body if per-bronchial instrumentation fails; nor is reference made to the removal of pus, and to the irrigation of cavities in cases of abscess and bronchiectasis, which Chevalier Jackson, among others, has brought to such a fine art in America. The chapter on Surgery of the Pleura, by Felix Landois, includes injuries to the lungs and pleura. Apart from the omission of traumatic asphyxia, of the important work of the Empyema Commission and of E. A. Graham, and a lack of emphasis on the dangers of early open drainage of pyothorax, the article is good and comprehensive. The final chapter deals with the diaphragm, diaphragmatic hernia, and the phrenic nerve. Herniæ are discussed thoroughly and the various methods of approach and of closure; phrenic evulsion is less completely discussed.

The second volume contains two articles. The first, Die Chirurgie der Lungen-erkrankungen, is by W. Jehn. It is clear, concise, and instructive. Space does not permit of details of technique of operations, but the article is well written and well illustrated. In the description of treatment of lung abscess no reference is made to the value of artificial pneumothorax or to thoracoplasty. Again, in the discussion on treatment of bronchiectasis, cautery lobectomy is not mentioned. The second article on Die Chirurgie des Brustkorbes, by A. Schubert, is admirable. It must certainly rank as one of the most complete and detailed articles extant on this subject.

DISEASES OF THE SKIN.

Seventh edition. By RICHARD L. SUTTON, M.D., Sc.D., Professor of Dermatology, University of Kansas School of Medicine. In 2 vols. London: Henry Kimpton. 1928. With 1237 illustrations and 11 coloured plates. Pp. 1394. Complete 52s. 6d.

ALTHOUGH approximately 100 pages and illustrations have been added since the sixth edition of this important text-book was reviewed in these columns two years ago, the price remains the same, and we may fairly assume that there will be no diminution in the demand for it. Until a simple and cheap method of colour photography is available, no one could hope to better the illustrations in this work, while the text, the copious and orderly references, brought up to the latter half of 1927, afford a source of information as reliable and succinct as any work on modern dermatology. The author makes constant acknowledgments of the work of his American and European contemporaries.

No branch of the subject is neglected, and the photomicrographs of the various pathological conditions described are admirable. In an age when the clinical manifestations of syphilis are rarely seen in the out-patient departments of our teaching hospitals, the student requires some visual assistance from illustrations, and even the expert may occasionally require an ocular reminder of type. In this volume there are no less than 12 examples of extragenital chancres alone in the illustrations of the disease, while the clinical photographs from 85 actual cases of syphilodermata and congenital syphilis are supplied, excluding those devoted to the study of the histology. The increasingly important subject of ringworm is also treated exhaustively, both on the clinical and pathological sides. Some 50 illustrations accompany the text, and it is interesting to note that the author for the present, at any rate, expresses himself as being opposed to the recently introduced method of treatment by acetate of thallium for tinea tonsurans.

The rarer diseases, such as yaws, blastomycosis, sporotricosis, creeping eruption, favus, tinea imbricata, and many others are profusely illustrated. There are few errors or even faults of arrangement or method. One small point that might lead to confusion appears to have escaped the scrutineers of both the sixth and seventh editions. On pp. 1180 and 1267 respectively the treatment of tinea tonsurans and tinea unguium should have received the dignity of separate paragraphs, instead of being allowed to run into each other. There does not appear to be a reference to tinea unguium or even ringworm of the nails in the index. These are almost the only points to criticise in a splendid work which all dermatologists should buy.

RECENT ADVANCES IN PHYSIOLOGY.

Third edition. By C. LOVATT EVANS, D.Sc., F.R.S., Professor of Physiology, University College, London. London: J. and A. Churchill. 1928. With 86 figures. Pp. 403. 12s. 6d.

THREE editions of this excellent book have appeared in three years. While adding two new chapters the author has wisely kept the volume to a handy size by omitting three chapters which appeared in earlier editions on hæmatology and cardiac output, which subjects are now clearly dealt with in standard text-books on physiology. The exploitation of physical methods for the study of excitability, chronaxie, and the nature of the nervous impulse is leading to discoveries of fundamental importance; a description of the technique and present position of these studies is presented in the two new chapters in that concise manner which can emanate only from the pen of an experienced worker and teacher. The value of the book is enhanced by the additions, and this edition, too, is likely to be exhausted as rapidly as its predecessors.

HIGH FREQUENCY IN OTO-RHINO-LARYNGOLOGY.

La Haute Fréquence en Oto-Rhino-Laryngologie. Second edition. By LEROUX-ROBERT, Chief of the Physiotherapeutical Branch of the Laryngological Department of the Saint Louis Hospital. Paris: Masson et Cie. Pp. 216. Fr.26.

THIS book on the use of high-frequency currents in diseases of the throat, nose, and ear, was reviewed in our columns[1] on its appearance some three years ago. There is but little alteration in the second edition. One effect obtained by the high-frequency current—namely, diathermo-coagulation, or surgical diathermy—is largely employed by laryngologists in this country. The other forms include diffuse or medical diathermy, "effluve" or "violet ray," and sparking currents or fulguration; these the author uses in a large number of very various conditions, including ozæna, in which he claims to have obtained good results. At the experimental stage, in which this work must still be placed, it would have been helpful if Dr. Leroux-Robert had given a more exact statement of results, and had not been content merely to describe a few selected cases. The applications of surgical diathermy are dismissed with comparative, and rather disappointing, brevity.

[1] THE LANCET, 1925, ii., 1287.

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Colombo. R. L. SPITTEL, F.R.C.S. Eng.

THE LANCET.

LONDON: SATURDAY, NOVEMBER 24, 1928.

WHAT IS A GOOD RADIOGRAM?

IN the medical world there is generally a question of the day, when a particular operation or line of treatment or diagnosis is being decried by some and as warmly defended by others. At present radiology is holding the stage. As there is a certain section of the lay public which prefers a medical attendant with alcoholic tendencies on the ground that "he is so clever when sober," so there is in the medical profession a section which blindly follows the result of an X ray examination and believes as it were in a radiogram per se, not knowing whether it is good, bad, or indifferent. This attitude of mind leads to many mistakes and produces much indifferent work. Sir THOMAS HORDER is credited in the lay press with having stated at the Congress on Radiology that the consulting rooms are flooded with bad radiograms. Our own reporter's version of his remarks (see p. 1077), is to the effect that the contribution made by radiology towards the diagnosis of alimentary disease would be even greater than it is if the standard of radiograms were raised. A number of indifferent radiograms might well be exchanged for one or two good ones. The question then arises as to what constitutes a good radiogram. It is easier to say that a bad radiogram is one in which some variation from the normal is not shown owing to want of reasonable care or knowledge on the part of one or other of the persons concerned. But does the onus of a bad radiogram rest entirely on the radiologist? We venture to think not. Other possible culprits, assuming that first-class modern apparatus is used, can only be the patient, and the physician or surgeon at whose request the work is undertaken. The person advising an X ray examination should pass on to the radiologist a tentative diagnosis and such information as will be of use to him in carrying out his part of the work. It is not fair to present the patient to the radiologist in the light of a cross-word puzzle with only the clues present; rather as much as possible should be filled in, and the radiologist asked to complete the missing letters in the light of his special knowledge and opportunities. Opinions differ as to whether a second detailed history should be taken by the radiologist. Some believe that this is desirable on the ground that important points may be elicited which were not mentioned by the patient at the first examination. Such a procedure does not appeal to us. Provided he is furnished with the main facts of the case, as he has a right to be, the time of the radiologist is better employed on his own specialised work. The 15 to 20 minutes so saved may allow of another good look at a doubtful duodenum or an extra film from a different angle. It does not appear right or courteous to send a patient for radiological examination with such captions as "X ray right leg" or "barium meal"; the addition of "? Potts fracture" or "suspect duodenal ulcer" at once focuses attention on the immediate problem. The radiologist is a consultant in the light of his specialised knowledge, and it is surely common sense to work up his case for him so that the greatest use may be made of his powers. The preparation of the patient for special X ray work should be dictated by the radiologist, for his technique is based on a definite preparation and variation from this may lead to error. Lastly, the radiologist must be allowed sufficient time (1) to carry out his examination and (2) to study his plates. Too often he is given 24 or 36 hours in which to administer and report on a barium meal, and is then held up to scorn by a chagrined physician when a ring carcinoma of the sigmoid is found some months later by a complacent surgeon. The radiologist is to blame in allowing himself to be led into such a false position.

The first essential, then, for a good radiogram is full coöperation between physician or surgeon on the one hand and radiologist on the other, before a plate is taken. With the patient the radiologist is bound to exercise his technical skill and his common sense to the utmost. He must be prepared with every legitimate trick of his trade to assist the colleague who has placed a patient in his hands for a special opinion. He cannot afford to confine himself merely to one line of approach, but must be ready to modify his technique as occasion demands. When using only so-called light meals little is learned about the peristalsis of the stomach, while if that organ is only studied fully filled the condition of the mucous membrane cannot be definitely ascertained. In alimentary work a great part of the bowel must be seen in all profiles, for many an ulcer is concealed in the ordinary antero-posterior view. The true character of a gastric papilloma can only be revealed when the patient is studied in various postures. Serial films will demonstrate a rigid piece of bowel and stereoscopic views help to establish the relative position of a shadow. The emptying of a viscus may be more important than the filling, and the completion of an alimentary X ray examination without an opaque enema often leads to disaster. This all takes time, and the radiologist must not be hurried. The man who runs through 20 barium meals in a morning will miss abnormalities picked up by his colleague who refuses to undertake more than four or five. A good radiogram, then, demands from the radiologist the highest technical skill, modified as the occasion demands, and it is generally one of a series, the others being used for purposes of comparison. There remains the most important point, interpretation, to which all the technical work has been preliminary. This again should be done in coöperation. Both sides pool their knowledge and a result so obtained is the one most satisfactory to the third partner—the patient. In work involving hollow viscera, both physician and radiologist should follow their case to operation whenever possible. To be told about it is not sufficient. Experience gained in this way is of the utmost value, for it is then seen what caused the shadow. Dr. BARCLAY told the Congress that if clinical, radiological, and operative diagnoses were compared, it would be found that there was more often agreement between the two latter than the two former.

A good radiogram, then, is one of a series, in the choice of which there has been coöperation beforehand, taken by a radiologist who has exerted his full powers, and interpreted with due regard to previous experience. In the case of a moving viscus it must never be forgotten, as Mr. WALTON remarked at the same discussion, that an X ray film is but a single photograph of a cinematographic performance. Only the watcher of the screen will see the whole plot, and conversely his eye may miss some of the things which the photograph fixes. There is still plenty of room for increased accuracy in diagnosis if radiologist and clinician work hand in hand.

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LONDON: SATURDAY, NOVEMBER 24, 1928.

WHAT IS A GOOD RADIOGRAM?

IN the medical world there is generally a question of the day, when a particular operation or line of treatment or diagnosis is being decried by some and as warmly defended by others. At present radiology is holding the stage. As there is a certain section of the lay public which prefers a medical attendant with alcoholic tendencies on the ground that "he is so clever when sober," so there is in the medical profession a section which blindly follows the result of an X ray examination and believes as it were in a radiogram per se, not knowing whether it is good, bad, or indifferent. This attitude of mind leads to many mistakes and produces much indifferent work. Sir THOMAS HORDER is credited in the lay press with having stated at the Congress on Radiology that the consulting rooms are flooded with bad radiograms. Our own reporter's version of his remarks (see p. 1077), is to the effect that the contribution made by radiology towards the diagnosis of alimentary disease would be even greater than it is if the standard of radiograms were raised. A number of indifferent radiograms might well be exchanged for one or two good ones. The question then arises as to what constitutes a good radiogram. It is easier to say that a bad radiogram is one in which some variation from the normal is not shown owing to want of reasonable care or knowledge on the part of one or other of the persons concerned. But does the onus of a bad radiogram rest entirely on the radiologist? We venture to think not. Other possible culprits, assuming that first-class modern apparatus is used, can only be the patient, and the physician or surgeon at whose request the work is undertaken. The person advising an X ray examination should pass on to the radiologist a tentative diagnosis and such information as will be of use to him in carrying out his part of the work. It is not fair to present the patient to the radiologist in the light of a cross-word puzzle with only the clues present; rather as much as possible should be filled in, and the radiologist asked to complete the missing letters in the light of his special knowledge and opportunities. Opinions differ as to whether a second detailed history should be taken by the radiologist. Some believe that this is desirable on the ground that important points may be elicited which were not mentioned by the patient at the first examination. Such a procedure does not appeal to us. Provided he is furnished with the main facts of the case, as he has a right to be, the time of the radiologist is better employed on his own specialised work. The 15 to 20 minutes so saved may allow of another good look at a doubtful duodenum or an extra film from a different angle. It does not appear right or courteous to send a patient for radiological examination with such captions as "X ray right leg" or "barium meal"; the addition of "? Potts fracture" or "suspect duodenal ulcer" at once focuses attention on the immediate problem. The radiologist is a consultant in the light of his specialised knowledge, and it is surely common sense to work up his case for him so that the greatest use may be made of his powers. The preparation of the patient for special X ray work should be dictated by the radiologist, for his technique is based on a definite preparation and variation from this may lead to error. Lastly, the radiologist must be allowed sufficient time (1) to carry out his examination and (2) to study his plates. Too often he is given 24 or 36 hours in which to administer and report on a barium meal, and is then held up to scorn by a chagrined physician when a ring carcinoma of the sigmoid is found some months later by a complacent surgeon. The radiologist is to blame in allowing himself to be led into such a false position.

The first essential, then, for a good radiogram is full coöperation between physician or surgeon on the one hand and radiologist on the other, before a plate is taken. With the patient the radiologist is bound to exercise his technical skill and his common sense to the utmost. He must be prepared with every legitimate trick of his trade to assist the colleague who has placed a patient in his hands for a special opinion. He cannot afford to confine himself merely to one line of approach, but must be ready to modify his technique as occasion demands. When using only so-called light meals little is learned about the peristalsis of the stomach, while if that organ is only studied fully filled the condition of the mucous membrane cannot be definitely ascertained. In alimentary work a great part of the bowel must be seen in all profiles, for many an ulcer is concealed in the ordinary antero-posterior view. The true character of a gastric papilloma can only be revealed when the patient is studied in various postures. Serial films will demonstrate a rigid piece of bowel and stereoscopic views help to establish the relative position of a shadow. The emptying of a viscus may be more important than the filling, and the completion of an alimentary X ray examination without an opaque enema often leads to disaster. This all takes time, and the radiologist must not be hurried. The man who runs through 20 barium meals in a morning will miss abnormalities picked up by his colleague who refuses to undertake more than four or five. A good radiogram, then, demands from the radiologist the highest technical skill, modified as the occasion demands, and it is generally one of a series, the others being used for purposes of comparison. There remains the most important point, interpretation, to which all the technical work has been preliminary. This again should be done in coöperation. Both sides pool their knowledge and a result so obtained is the one most satisfactory to the third partner—the patient. In work involving hollow viscera, both physician and radiologist should follow their case to operation whenever possible. To be told about it is not sufficient. Experience gained in this way is of the utmost value, for it is then seen what caused the shadow. Dr. BARCLAY told the Congress that if clinical, radiological, and operative diagnoses were compared, it would be found that there was more often agreement between the two latter than the two former.

A good radiogram, then, is one of a series, in the choice of which there has been coöperation beforehand, taken by a radiologist who has exerted his full powers, and interpreted with due regard to previous experience. In the case of a moving viscus it must never be forgotten, as Mr. WALTON remarked at the same discussion, that an X ray film is but a single photograph of a cinematographic performance. Only the watcher of the screen will see the whole plot, and conversely his eye may miss some of the things which the photograph fixes. There is still plenty of room for increased accuracy in diagnosis if radiologist and clinician work hand in hand.

THE NEXT STAGE.

LAST week we printed a summary of the explanatory memorandum on the provisions of the Local Government Bill and devoted special attention to the proposals for poor-law reform. There remain many other important aspects of the proposed changes which all who are interested in public health will desire to study. It must not be forgotten that the full view of those changes will not be revealed by the text of the Bill alone. The Government has evidently been anxious to leave the initiative in many instances in the hands of the present local authorities, and the "administrative schemes" which those bodies will be expected to submit to the Minister of Health will require close examination. The transferring of hospitals under the Bill raises a point in which the medical profession must take the keenest interest—namely, the imperative need of enlisting and retaining the collaboration of the general practitioner. We have to contemplate that, under the poor-law provisions of the Bill, the county councils will obtain control of almost every public institution in the county area. County councils and county district councils are at present responsible, and will remain responsible, for providing hospitals for infectious diseases. The county council will have to consider which of the existing institutions are suitable for infectious diseases hospitals and how best the existing deficiencies of accommodation can be made good. Clause 11 of the Bill, making consequential amendments of existing law, will give the county council the powers of a local sanitary authority for providing places for the reception of the sick and such provision is to include the conduct of normal labour, which the courts have held not to be included under sickness. The explanatory memorandum adds that Clause 11 also authorises county councils to subscribe to voluntary hospitals, but the Bill is not explicit on this point. The upshot of these arrangements will be that the county council must somehow evolve an orderly system in collaboration with other bodies. It must (under Clause 51) survey the whole accommodation for infectious diseases treatment in the county, put up an adequate scheme for the coördinated use of the hospitals, and arrange for the joint use of institutions owned by single authorities or the provision of additional facilities. If the district councils do not play their part in the scheme, the Minister may transfer their functions to the county councils; if the latter are in default, the Minister may make a scheme himself. All this surveying and unification is admirable enough, but neither the Bill nor the memorandum discloses how the medical personnel of the country is to be applied to the tasks set by the proposed legislative changes. In certain minor ways—for instance, in the insistence on progress towards a system of whole-time public health appointments—the general practitioner may begin to feel that his services and experience will not be welcomed. What steps are being taken to reassure him? We have to remember, of course, that the real campaign for the exposition of the Bill in Parliament and in the country has not yet begun. When the Minister brings to bear upon his immense task his well-known gifts of lucid statement, we shall hope to hear some definite suggestions as to the use to be made of the medical profession.

THE WHITE CELLS IN INFECTION.

THAT infection by the so-called pyogenic organisms is associated with an increase of cells of the neutrophilic granular polymorphonuclear order is so well known that there is a tendency to regard this granular leucocytosis as the only possible response of the white cells to infection. Some of these conditions, however, may produce blood pictures of quite another kind, and two of them, leucopenia and leucocytosis, have special diagnostic importance. The leucopenia of typhoid infection long since found its way into the text-books and lectures, though it is still not fully realised, perhaps, that it is of prime importance in the early diagnosis of enteric fever. The leucopenia of uncomplicated "influenza" is also fairly well recognised, and is one of the grounds for believing that this condition constitutes an entity. So-called catarrhal jaundice, again, is also usually associated with leucopenia.

In the above diseases the decrease of white cells mainly affects the granular leucocytes and thus gives rise to a relative lymphocytosis. In contradistinction to them there are certain other conditions characterised by an actual increase in the number of the mononuclear cells without diminution of the polymorphs; here the picture is one of lymphocytosis without leucopenia. Common, though not very striking, examples of this reaction are seen in measles and mumps, but the most arresting one is found in the condition now commonly known as "infective mononucleosis," whose identity with the "glandular fever" described many years ago by PFEIFFER may be taken as established. In this condition the number of white cells may rise to 20,000 or 30,000 per c.mm., and in extreme cases over 80 per cent. may belong to the mononuclear order. Studies of this disease have lately appeared both in France and America. P. CHEVALIER[1] finds none of the ætiological theories satisfactory, and he concludes that the evidence points to specific infection by an unknown agent. L. D. CADY,[2] of St. Louis, lays down certain diagnostic criteria, the most important of which, so far as the blood picture is concerned, are the absence of anæmia and the presence of the characteristic mononuclear cells originally described by DOWNEY and MCKINLEY.[3] These were placed in three classes, the most numerous and the most important for diagnostic purposes being somewhat larger than normal lymphocytes, with basophile cytoplasm and an eccentric and lobed nucleus. CADY remarks that although usually regarded as a disease of children infectious mononucleosis may occur at any age, up to 40 at any rate. J. E. COTTRELL,[4] writing from Philadelphia, has also observed a series of cases, and draws attention to the necessity of making the differential diagnosis not only from lymphatic leukæmia but also from Vincent's angina with agranulocytosis. In making a decision the recognition of Downey and McKinley's cells is of great importance. The absence of anæmia should exclude leukæmia and severe ulceration of the tonsils, with recovery of the characteristic fusiform bacilli and spirochætes in smears therefrom, will establish a diagnosis of angina. HERBERT FOX,[5] also working at Philadelphia, has studied the histology of a tonsil and of a lymph-gland from a case of infective mononucleosis. Both showed hyperplasia of the

[1] Sang, 1928, ii., 166.
[2] Amer. Jour. Med. Sci., 1928, clxxv., 527.
[3] Downey, H., and McKinley, C. A.: Arch. Int. Med., 1923, xxxii., 82.
[4] Amer. Jour. Med. Sci., 1927, clxxiii., 472.
[5] Ibid.

lymphatic cells, notably of the small ones but also to some extent of the large mononuclears of the germ centres. This worker applied the "supravital" technique of SABIN to the cells from the glands, and satisfied himself that the proliferating cells were actually lymphocytes. Whatever may be the source of the cells giving rise to the increased white count in infective mononucleosis the blood picture produced in man is strongly reminiscent of that seen in infection of rabbits by *Bacillus monocytogenes*, the organism described in 1926 by MURRAY, WEBB, and SWAN.[6] By the use of the supravital technique WITTS and WEBB[7] have demonstrated that the increased white cells in this condition actually are monocytes and not of the lymphoid order. Until the same has been done for the peculiar cells of infective mononucleosis their exact nature cannot be regarded as proved. In this connexion it is interesting to note that the avenue of infection by *B. monocytogenes* in the rabbit is the alimentary canal—a route which apparently remains unexplored in connexion with infective mononucleosis in man.

Both leucopenia and lymphocytosis may then represent a response to certain types of infecting agents, of which the bacillus of EBERTH and the unknown organism of infective mononucleosis may be taken as examples. It should be borne in mind, however, that under certain circumstances a leucopenia with a relative lymphocytosis may represent the only response possible on the part of a damaged or abnormal bone-marrow. A number of cases of leucopenia with lymphocytosis in the face of an acute infection involving the bone-marrow were described by S. C. DYKE[8] in our columns in 1924; and that the peculiar blood picture occurs quite regardless of the nature of the infecting agent was demonstrated by the fact that in three of them the infecting organisms were respectively a streptococcus, the tubercle bacillus, and the colon bacillus. There is some reason to believe that in such cases the bonem-arrow is abnormal to start with. Evidence in support of this view is contributed by VLADIMIR JEDLICKA,[9] who describes a patient who showed leucopenia or a poor polymorph percentage in the course of several acute infective conditions, finally dying from septicæmia with a white count of 15,000 cells per c.mm., over 80 per cent. of which were myeloblasts; the myeloblastic response in this case obviously represented the death struggle of a previously aplastic bone marrow. The general conclusion to be reached is that leucopenia or lymphocytosis or both in the course of an acute infection should give rise to consideration whether the peculiarity of the white count is due to the nature of the infecting organism or to some abnormality of the bone marrow. Sometimes the answer to this question may not be easy.

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[6] Murray, E. G. D., Webb, R. A., and Swann, M. B. R.: Jour. [illegible], 1926, xxix, [illegible].

[7] Witts, L. J., and Webb, R. A.: Jour. Path. and Bact., 1927, [illegible].

[8] THE LANCET, 1924, ii, 1015.

[9] [illegible], 1928, ii, 10.

[illegible] OF BROMPTON HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST.—[illegible] Dodds, the President, last week opened [illegible] of the hospital which have [illegible] than half of which have not been [illegible]. A [illegible] of [illegible] and found that [illegible] a [illegible] which will [illegible] of the establishment of a [illegible] and other organisations [illegible] the [illegible] has dealt with, also [illegible] and [illegible] departments.

Annotations.

"Ne quid nimis."

ULTRA-VIOLET LIGHT AND CANCER.

THE value of heliotherapy is now well established, and the general public is fully aware of the importance to the ordinary individual of an adequate amount of sunlight throughout the year. But, unfortunately, in this country we have too often to content ourselves with the belief that there is a sun still shining in the sky, ocular proof being denied us. In the quartz mercury-vapour lamp, however, we have an efficient substitute for the sun, or even an improvement on it, for the lamp emits rays which do not appear in the solar spectrum. The lamp is used extensively for therapeutic purposes, and is even employed prophylactically in the domestic bathroom, and except for an occasional burn no one appears to have been any the worse. In a communication appearing in another column, however, Dr. G. M. Findlay brings forward experiments which suggest that ultra-violet light may not always be beneficial in its results. He points out that since 1896 when Unna described under the name "Seemanshaut" the development of cancer of the skin after prolonged exposure to weather, evidence has been steadily accumulating that strong sunlight acting over a period of time may be followed by the growth of carcinoma in the exposed areas of skin. The incidence of this form of cancer is, of course, comparatively small, but there seems no doubt that it actually does occur. With these facts in view Dr. Findlay planned a series of experiments to determine whether ultra-violet light had any carcinogenic action on the skin. A series of mice were tarred on the back in the usual way, after epilation with sodium sulphide, and a certain number of them were also exposed for a brief period four times a week to the rays from a quartz mercury-vapour lamp. It was found that the mice which were exposed to the ultra-violet light developed cancer more rapidly than the controls. In another experiment ten mice were tarred and exposed to the mercury-vapour lamp for one month, ten other control mice being tarred alone for the same period. Both tarring and irradiation were then stopped. At the end of 36 weeks no tumours had developed in the control mice, but three of the irradiated animals had developed cancer, all, in fact, of those who survived, for the mortality among them was high. Finally, 20 mice were epilated and exposed to ultra-violet without being tarred. The mortality in this experiment was again high, but seven of the animals developed innocent or malignant tumours in the exposed area.

Dr. Findlay draws the conclusion that mice exposed to ultra-violet light for a period of not less than eight months develop papillomata or carcinomata. Also, that when a known carcinogenic agent is at work its action is hastened if the animals are also irradiated. And he holds that these experiments support the hypothesis that in man exposure to ultra-violet light plays an important part in the development of cancer of the skin in certain situations. While it is clear that these experiments must be amplified, the conclusions drawn from them appear to be fully justified, and they open up very interesting possibilities. It is true that no case has ever been reported of the development of cancer of the skin after irradiation with ultra-violet light, but it must be remembered that this method of treatment is as yet in its infancy. Various forms of chronic irritation are recognised as causing cancer in man, but except in rare instances they must act over long periods of time. As yet sufficient time has not elapsed for any untoward results of ultra-violet light exposure to declare themselves, if, indeed, they ever will. It is to be hoped they never will, and an alarmist policy is the last thing to be encouraged.

Nevertheless, it is well for us to be reminded that light is a very powerful agent which should be used with caution until we are better acquainted with its biological applications.

THE FIFTEENTH SESSION OF THE DENTAL BOARD.

THE autumn session of the Dental Board of the United Kingdom was a short one. In opening it Sir Francis Dyke Acland referred sympathetically to the loss through death of Sir James Hodsdon at the height of his powers, a man whose sagacity and judgment had been at the disposal of the Board and whose wise counsel had been sought in any difficulty. Sir Charles Tomes was one of the Board's trustees at the time of his death, and Sir Francis recalled with gratitude the help received from him in the formidable task of preparing his first address to the Board. He touched on the difficult question of the retention fee, remarking that the Board had fixed a really low payment for practitioners in their early years and thereafter one at which no one ought to grumble. He had come to the conclusion that although financial resources must be carefully husbanded for some years, the Board would not be unduly cramped either in continuing its present work or in starting upon certain new work which was in sight. In a few years the increase of fee income should allow of some expansion. The policy of assisting certain dental schools to provide better teaching, was, he thought, a useful lever for establishing dentistry upon the same plane as any other school of a University or for obtaining the independence due to a particular school. Whilst spending money in this direction the Board had been obliged to be less liberal than heretofore in granting bursaries, and in September last some applicants who might have received grants in previous years were turned down on financial grounds. There had been the usual variety in the type and age of applicants, and whereas in the past bursaries had been awarded to about four-fifths of those eligible for them, the proportion was reduced to about one-half. The progress of the bursars at dental schools continued on the whole to be satisfactory. Turning to disciplinary measures, Sir Francis referred to the new advertising mechanism of daylight signs as applied to dental premises. He proposed that the Board should adhere to the established principle that announcements of practice should be sufficient only to enable persons seeking a practitioner's premises to find them, and he added: "I can think of few cases in which a daylight sign should be necessary for this purpose." Since the last session of the Board the Irish Free State had passed the Dentists Act of 1928, following closely the lines of the Medical Act of 1927, and introducing into dental legislation two important innovations: (1) the obligation on all dentists to pay an annual fee, and (2) the entire prohibition of company practice in the Free State. Finally, he welcomed the probable lightness of their penal duties, a result due, he thought, in part at least, to the strong warning given last session with regard to a certain class of offence.

THE THERMAL STABILITY OF INSULIN.

IT is of some importance both to practitioners and pharmacologists to know what sort of variation, if any, may be expected in the activity of medicinal substances when kept for prolonged periods. For this reason an investigation of the Destructive Action of Heat on Insulin, by August Krogh and A. M. Hemmingsen[1] is of special interest. Their actual experiments were made at temperatures from 50° to 117° C., rather above probable storage temperatures. They were all carried out on sterile watery solutions of insulin of about 15 international units per milligramme buffered to pH 3·5 to 4·5, and the activity of the remaining insulin was determined either by the rabbit blood-sugar test of Marks or the mouse convulsion test described by the authors, which gave satisfactory concordant results. Decomposition was found to follow the course which would be predicted by the law of mass action, and on the whole was comfortingly slow. After 623 hours—nearly four weeks—at 50° C., about 60 per cent. of the original activity remained. At the higher temperatures action was naturally much more rapid; in fact, it was found to follow very well Arrhenius's relation between absolute temperature and the velocity constant. The points of chief interest from a medical point of view are that between pH2 and pH4 the rate of destruction is not appreciably altered, and that at temperatures likely to occur in ordinary practice the change is very slow, as the following table shows:—

		Time for the activity to fall.		
		5%	10%	50%
40° C.	= 104° F.	½ month	1 month	¼ year
30°	= 86°	2 months	4 months	2 years
20°	= 68°	9 "	1½ years	10 "
10°	= 50°	4½ years	8½ "	56 "
0°	= 32°	29 "	58 "	377 "

These times are obtained by extrapolation below the temperatures of experiment and may, in some cases, be in error to the extent of 50 per cent. But they serve to illustrate the satisfactory stability of insulin under ordinary conditions.

[1] Biochem. Jour., 1928, xxii., 1231.

LARYNGEAL TUBERCULOSIS.

OF this affection Sir Morell Mackenzie said in 1880 that "the prognosis is always extremely grave, and it is not certain that any cases recover." Since then, however, the outlook has very greatly improved, and it is important that this improvement should be realised, not only by the patients and their friends, but by all practitioners in charge of these cases. A feeling of despair prevents patients from seeking adequate treatment, and persevering in it, whereas the hope of final cure will be found to encourage many to persist in what is often a lengthy and tedious régime. That some degree of hopefulness is justifiable is shown by the experience of Dr. E. A. Looper and Dr. L. V. Schneider with 500 cases at the Maryland State Sanatorium in the past six years.[1] Of these cases 142 were classed as having "moderate lung involvement," and 358 "advanced lung involvement"; in the first group 108 patients, or 76 per cent., were "improved and healed," and of the second group 109, or 30 per cent. It is well known that the prognosis of laryngeal tuberculosis depends very largely upon the extent and the progressive character of the pulmonary disease; the class of case admissible at different hospitals and sanatoriums also varies greatly. Looper and Schneider do not define what is meant by moderate or advanced lung involvement, and do not seem to have adopted a definite method of classification, such as the Turban-Gerhardt. In these circumstances statistics have only a relative value, and, judging by the discussion that followed a reading of the paper at the Minneapolis congress, the percentage of cures is higher than that obtained by other laryngologists in America. In this country Sir StClair Thomson[2] reported 25 per cent. of cures at the King Edward Sanatorium at Midhurst, and Mr. Harold Barwell[3] about 21 per cent. at Mount Vernon Hospital, where cases admitted in an advanced stage for the relief of dysphagia were excluded from the statistics. Both these authorities agree with Looper and Schneider in insisting on the importance of periodic examination of the larynx in all cases of phthisis. The methods of treatment advocated are also those most generally accepted in this country and may be summed up as general sanatorium regimen, silence, and galvano-cautery puncture. Contraindications to the last method of treatment are high temperature, marked asthenia, and high blood pressure; the American writers enunciate a sound

[1] Jour. Amer. Med. Assoc., Oct. 6th, p. 1012.
[2] THE LANCET, 1924, ii., 948.
[3] Diseases of the Larynx. London. 1928.

principle, that no laryngologist should undertake electro-cautery treatment without the coöperation of a clinician, and they add that indiscriminate use of the cautery in unsuitable cases will do more harm than good, and the method of treatment itself will thus be brought into disrepute. They give figures to show the beneficial results of treatment by the cautery. In the group of moderate involvement of the lung 65·5 per cent. had the larynx cauterised and were healed and 10·6 per cent. were healed without cauterisation; but many of the latter class were patients with more active disease whose general condition did not allow of this method of treatment. Statistical comparisons of this kind are thus obviously open to fallacy, but there is no doubt that galvano-cautery puncture is a valuable method of treatment in carefully selected cases. It is interesting to observe that experience in the United States agrees so closely with that in England. Looper and Schneider have done good service in bringing this method to the notice of their colleagues, for they rightly remark that it is surprising that this form of treatment is not more generally employed.

TRAUMATIC RETINAL ANGIOPATHY.

A VERY rare condition of the fundus, ascribed to a contusion of the skull, was described at the Heidelberg Ophthalmological Congress of 1910 under the title Angiopathia Retinæ Traumatica by Purtscher, of Klagenfurt. It was due, he suggested, to an effusion of lymph into the retina following a sudden rise of pressure in the cranium, a direct connexion being assumed to exist between the cerebro-spinal fluid and the perilymphatics of the retinal veins. A few similar cases have since been observed, and C. H. Chow, of Peking, adds another in the November number of the *British Journal of Ophthalmology*. It was the result of a blow with a cricket ball on the orbit and right side of the face. A week after the accident there was a patch of opacity along the course of the upper temporal vessels extending from the disc about 5 or 6 disc-diameters. There was considerable disturbance of pigment and an absolute scotoma corresponding to the lesion. Five weeks later there was extensive migration of the pigment from the outer retinal layers to the inner, where it was seen in the form of minute black dots apparently outside the sheaths of the retinal vessels. The author finds that in his case the pigment was non-hæmorrhagic and non-inflammatory, and that it was derived from the pigmented epithelial layer of the retina. The scotoma remained unchanged. A somewhat similar case has recently been reported with photographs of the fundus in the *Archives of Ophthalmology* by A. J. Bedell, of Albany, New York. No reference is given to any similar case reported in Great Britain.

THE INHERITANCE OF MIGRAINE.

ALTHOUGH not in itself a serious complaint, migraine in the aggregate ranks high as a cause of suffering and invalidity in the general population. It forms a readily recognisable symptom-group, and though its ætiology and mechanism of production is unknown, and treatment, prophylactic or curative, at the best unsatisfactory, there are certain features closely associated with it. Of these, a history of similar attacks in parents or other members of the family has been the subject of attention from time to time since as far back as the beginning of the eighteenth century. During that period the reported proportion of cases of migraine in which a parental history is obtainable has gradually risen until at the present time the view is held that in almost all instances a hereditary tendency is manifest. In a recent paper,[1] read at a joint session of Eugenics Societies in New York, Dr. William Allan has dealt with this aspect of the subject. He defines migraine as "any headache beginning in early life, recurring regularly or irregularly over a long period of years, without discoverable pathological process and without materially affecting the general state of health," and he then proceeds to associate his observations on the familial occurrence of the complaint with the laws of heredity originally propounded by Mendel. The few previous attempts of this nature have led to contradictory findings as to the dominance or recessiveness of the trait. This is not surprising, for where the character (migraine) is a subjective phenomenon not capable of mechanical measurements, and its allelomorph is not a definite character, but simply absence of headache, the usual criteria of dominance and recessiveness are impracticable. The observed figures can only be compared with the expected results, the character being first considered as a dominant and then as a recessive. In dealing with any hereditary trait, it is necessary to know the relative frequency of the factors concerned, and from these can be calculated the relative occurrence of homozygous dominants, heterozygous dominants, and recessives. A positive history of migraine in a sample of 282 men was obtained by Dr. Allan in 57·4 per cent., whereas in 384 females the incidence was 62·6 per cent. Using these results it is possible to construct tables showing the results to be expected in mass matings of various types. On the basis of a general adult population incidence of 60 per cent. Dr. Allan has constructed two such tables considering migraine first as a dominant and then as a recessive character, and with these he has compared the actual findings in his series of 500 cases. The genetic and statistical evidence presented by the author is in close accord with the results to be expected if migraine be regarded as a dominant unit Mendelian character. A possible source of error, however, lies in the figures collected for the incidence of migraine in the general adult population, from which the samples were taken. A percentage of over 50 seems surprisingly high, and it is a debatable point whether the definition of migraine which formed the basis of the investigation was not too broad.

[1] Archives of Internal Medicine, 1928, xlii., 590.

CONTROL OF MALARIA IN CENTRAL AMERICA.

IN presenting his sixteenth annual report[1] to the United Fruit Company which has immense activities in the development of Central America, Dr. W. E. Deeks, general manager of the medical department, admits that malaria is still their major problem. Dr. Deeks has himself contributed in no small measure, both by his own work and by the stimulating efforts of example, to the solution of the control and cure of the disease which stands across the progress of the company's work. In the present report the papers by Dr. O. T. Brosius, Dr. M. A. Barber, Dr. W. H. W. Komp, and Dr. N. P. McPhail on the special properties of quinine and plasmoquine in malaria are the most searching that have yet appeared, based as they are on a vast clinical material. As a result of these studies, Dr. Deeks sets out his conclusions as follows: (1) Quinine is specific against the schizonts of all kinds of malaria and these are responsible for the clinical symptoms. In acute cases it is still the drug of election, but in order to obtain prompt results, large doses (2–3 g. daily) must be given. (2) In acute cases the exhibition of quinine for short periods favours the appearance of gametocytes in the peripheral blood, either by driving the gametocytes from the deep viscera, or by creating an environment which causes the development of increased numbers of gametocytes. When developed under quinine administration gametocytes are viable. (3) Plasmoquine is mainly effective against gametocytes, but it has also a marked action in clearing the schizonts of the tertian and quartan types of malaria from the peripheral blood, while upon the schizonts of the subtertian type its action is negligible and apparently, as in Brosius's report, it does not prevent the development of blackwater fever. Moreover, it is not as

[1] United Fruit Company, Medical Department, 17, Battery-place, New York. 1927. Pp. 365.

effective in preventing relapses when administered alone as it is in combination with quinine. (4) Plasmoquine has a toxic action on crescents of subtertian malaria, and after a few doses mosquitoes feeding on infected individuals do not become infected. The use of plasmoquine thus, if this observation is confirmed, will be of great importance in malaria control. (5) If given in too large a dosage, or over too prolonged a period, plasmoquine may cause toxic symptoms. In a small percentage of cases there may be, as with quinine, an idiosyncrasy to the drug. The daily dosage should not exceed 0·06 g., and this should not be continued over a period exceeding six days unless the patient is under close observation. (6) The toxic symptoms are headache, giddiness, gastric distress, and cyanosis, and the drug may cause death. At the onset of toxic symptoms there is a leucocytosis and degeneration of the erythrocytes. (7) The administration of quinine in combination with plasmoquine apparently prevents the development of toxic symptoms and, because of this, and the therapeutic action of the two drugs on different phases of the parasite, they should always be given in combination in order to get the best clinical results. (8) Experience shows that for an adult the amount of quinine to be given daily in combination with plasmoquine depends upon the clinical symptoms. In chronic cases 1 g. daily will suffice; in acute cases 2–3 g. daily are necessary in order to obtain optimal results. (9) In ambulatory cases the daily dosage of plasmoquine should not exceed 0·04 g. in combination with 1–2 g. of quinine for a period not exceeding six days. Whenever possible all cases so treated should return for re-examination within three to four days after the course is completed.

HUMIDITY AND TUBERCLE.

THE high relative humidity which preceded the violent storms of last week had the usual depressing effect on those who cannot readily get rid of their superfluous heat. It seems that there are many people whose dermal organ is trained to react only to a small range of atmospheric conditions and who are easily upset by a dry wind or by moist stillness. While the devastating effect of these extremes is no doubt largely confined to those whose mechanism of heat balance is inefficient, a certain amount of evidence has accumulated as to the effect of rain-bearing winds on the health of the general population. In his last annual report to the Derbyshire Health Committee, of which a summary in other respects is given in another column, Dr. W. M. Ash records the results of an investigation into the influence of such winds upon cases of early phthisis in that county. The material analysed is a series of 306 first-stage cases which had been treated at the county sanatorium and followed up at their homes for four years after discharge. Dr. Ash comes to the conclusion that in Derbyshire, as Dr. W. Gordon found in Devonshire, and others have found in West Shropshire and elsewhere, there is evidence that patients with early phthisis die more often and recover more rarely when residing in exposure to strong prevalent rain-bearing winds than when residing in shelter from them. If these observations are of wide application they have their obvious bearing on the choice of sites for sanatoriums and for the residence of the individual tuberculous patient. Exact proof of this thesis is beset with a multitude of difficulties, suspected and unsuspected by those who have worked on the subject. The equation can hardly be solved where there are so many unknowns. A small but useful contribution, however, comes from the School of Hygiene and Public Health at the Johns Hopkins University, Baltimore, where two observers[1] have analysed the effect of high humidity and moderately high temperature on the susceptibility and resistance to tuberculosis in guinea-pigs. The result was in effect negative, for under the conditions of the experiment they found that the suceptibility and resistance of guinea-pigs to infection with a virulent strain of tubercle bacillus was no different at a temperature of 80° F. with 79 per cent. relative humidity, and a temperature of 69° F. with 45 per cent. relative humidity. These observers rightly remark that what is true of the guinea-pig is not necessarily true for other animals and human beings, especially in this case as the guinea-pig is originally a tropical animal; but the value of work of this kind is that it can be carried out under accurately controlled conditions, in which there are fewer unknown factors in the equation to be solved.

[1] Anna M. Baetjer and Linda B. Lange: Amer. Jour. of Hyg., 1928, viii., 935.

THE APPRAISAL FORM.

AN account[1] has reached us from America of a method of stimulating different forms of public health work which appears to have been used in some 200 cities during the past three years. It consists of a voluntary periodical stocktaking based not on the local need for civil health work, nor on the results of such work, nor even (except indirectly) on its quality, but on the amount of activity shown by the various local health agencies, official or voluntary. From a simple score card for dairies introduced in 1903 by the Health Officer of the District of Columbia and taken up by the Department of Agriculture, the idea of assessing health activity in this way developed in the United States through a series of more or less independent local schemes, some of which failed to fulfil any serious purpose through faulty methods of drawing up their schedules. The latest and most widely adopted form results from the joint efforts of the Committee on Administrative Practice of the American Public Health Association and of the American Child Health Association. It is issued by the former under the title of "Appraisal Form for City Health Work." The form is described as a document of 68 pages and the essential part of it—i.e., the scoring device—is divided into 11 sections, each section representing one of the common chief public health activities in cities. These are: vital statistics, communicable disease control, venereal disease control, tuberculosis control, prenatal hygiene, infant hygiene, pre-school hygiene, school-child hygiene, sanitation, including food, milk, water, and sewer control, laboratory service, and popular health instruction. Each of these is divided again into a number of "criteria," 131 in all, each with a numerical score attached to it. For instance, under communicable diseases come "nurses' visits per case diphtheria," and so forth; under tuberculosis, "clinic visits per 100 deaths," "cases reported per annual death"; under sanitation, "dwellings with sewer connexion per cent.," "milk pasteurised per cent.," and so on. An arbitrary standard of score was fixed, being based on the score reached by 25 per cent. of a group of cities in a preliminary trial. The assumption is obviously made, under several headings, that in no city all the cases needing treatment are reached; otherwise it is hard to see why it should count to a city's credit to have a high percentage of, e.g., tonsil and adenoid operations, or of heart and lung defects placed under a physician's care, or of glasses fitted or teeth extracted, all reckoned on the total number of school-children rather than on the relative need of the individual. One wonders, too, whether—even in American cities—the social class of the people concerned would not affect such scores as the percentage of nurses' visits or clinic visits in prenatal, infant, or pre-school welfare work, the percentage here again being reckoned on the total live births or pre-school population respectively. These and other points are, however, under consideration, and the need for changing standards and criteria is recognised. Industrial health measures and those for which the need is confined to special areas, such as malaria

[1] The Validity of the Appraisal Form as a Measure of Administrative Health Practice. By Philip S. Platt. Published by the American Public Health Association.

and hookworm control, are not as yet included. We note, too, that the preventive work done by the practitioner which so often goes unrecognised but is probably more effective than all the other measures, is so far completely left out of account, owing to the difficulty of getting any sort of records.

Among the uses claimed for this appraisal form are the auditing of a city's health resources and the provision of a definite goal, the measurement of progress year by year, the stimulation of individual health workers, and the encouragement of health agencies to keep better records. Moreover, it is naively suggested that it may serve to defend the record of a health officer on objective unbiased grounds when he is threatened with a political attack or removal. The total score obtained by a city is looked on as of minor importance compared to the value attaching to a methodical periodical self-analysis. The form is specially aimed at measuring the means to an end and not the results reached. Even if not misused, and no suggestion of unwise use of it has come to knowledge, it is not clear to us why the means should be preferred to the end as an object of measurement. Mr. Platt gives an analysis of the results obtained in applying the appraisal form to a group of 46 cities in 1926, referring also to a somewhat similar earlier trial on a group of 86 cities in 1923, and discusses in detail whether this form really measures what it sets out to measure, and the sort of revision that should be made. When the 46 cities are divided into groups according to their populations—these varied from 15,000 to 1,250,000, half being under 50,000—there is little difference between the high scores reached in each group, but much between the low ones; the lowest, as might be expected, are in the smaller cities. It would have been of some interest if the relation of total score to population had been given in more detail, since the figures suggest that up to a point (but not beyond it) health service provision increases with population; but it is unsafe to draw conclusions, for the 46 cities are by no means a random sample of American cities. The labour of making such a survey is not small. Mr. Platt estimates that the time for an individual to appraise a small or moderately sized city is one to two weeks, but in large or specially difficult cities it may take several months to finish the work, which involves scores of interviews and, where records are badly kept, much tabulation of raw data. It is debatable whether such labour is really spent to the best advantage, and whether the end in view would not be better served by the type of district survey provided by Mr. Mess's recent book, "Industrial Tyneside," lately reviewed in our columns,[2] rather than by this numerical marking system. The Tyneside method, though admittedly more laborious, incidentally fulfils all the aims of the appraisal form as well as providing an end-product full of interest and value instead of a numerical score. We doubt whether this particular method will be popular outside those communities which rely on local boosting and stunts such as "Better Cities Contests" to maintain the civic pride of their inhabitants.

Lady Osler, whose many bequests for the benefit of medical education are noted in another column (p. 1109), has left her house at Norham-gardens, Oxford, to the Dean and Chapter of Christ Church, to be assigned as an official residence for the Regius Professor of Medicine in the University of Oxford for the time being, or otherwise applied towards the endowment of that chair.

THE official report of the International Conference on Cancer held in London last July has now been issued as an imposing volume of nearly 600 pages. Some of the communications delivered at the conference have already been published in full in our columns or elsewhere, and, where this is so, only an abstract is printed in the report, which contains no illustrations other than charts. Its appearance will be welcomed by the delegates who had to choose which sections to attend, and even more by those unable to come to the conference at all. All the aspects of cancer were discussed from different points of view, and this record of the proceedings confirms the impression that the British Empire Cancer Campaign did a service to medical research in collecting a group of experts and inducing them to explain their experiences and exchange their views.

[2] THE LANCET, Oct. 27th, 1928, p. 876.

ON Saturday last Lord Mildmay of Flete, as Lord Lieutenant of Devon, opened the new Torbay Hospital which has been built to the design of Mr. H. Percy Adams. Founded in 1850, the original building has long been inadequate to the needs of Torquay, whose population has greatly increased of late years. As the site did not permit of expansion, Hengrave House and its grounds were purchased in 1924 from Mr. and Mrs. R. P. Kitson, who later added 7 or 8 acres as a gift. The donation of £100,000, since considerably augmented, by Mrs. Rowcroft, has made it possible to build on this site a modern hospital, including a children's ward, private wards, two operating theatres, and a maternity ward. Accommodation for out-patients is ample, and there is apparatus for electrotherapy and radiological work, including a supply of radium. An antenatal centre is to be added. By adaptation and additional building Hengrave House has been transformed into a nurses' home.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. E. L. Atkinson is placed on the Retd. List with the rank of Surg. Capt.

Surg. Comdrs.: J. H. B. Martin to *Egmont*, for R.N. Hospl., Malta; and J. D. Murphy to *President*, for three weeks' course at R.A.F. Medical Officers' School of Instruction.

Surg. Lt.-Comdr. H. Hurst to *Pembroke*, for Chatham Dockyard.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt. (D) W. M. Bull to be Surg. Lt.-Comdr. (D).

Surg. Sub.-Lt. A. R. Thomas to be Surg. Lt.

ROYAL ARMY MEDICAL CORPS.

Capts. to be Majs.: E. F. W. Mackenzie, R. D. Davy, F. A. L'Estrange, and W. M. Cameron.

Capt. A. G. Harsant to be Maj. (Prov.).

Capt. G. Fleming is re-empld. under Art. 507 (b), Royal Warrant for Pay and Promotion, 1926.

J. A. Timoney and W. G. Harvey to be Lts. on prob.

C. P. Allen to be Temp. Lt.

TERRITORIAL ARMY.

Lt. R. W. Power to be Capt.

RESERVE OF AIR FORCE OFFICERS.

Flight Lt. J. W. Harper is transferred from Class Dii. to Class Di.

Flight Lt. Dumaresq Le Bas relinquishes his commission on completion of service, and is permitted to retain his rank.

INDIAN MEDICAL SERVICE.

Capt. Jagat Ram Kochhar to be Maj.

Lt. J. C. Lamont resigns his commn.

Temp. Capt. A. N. Duggal relinquishes his temp. commn.

CHRISTMAS MEDICAL TOUR IN THE FRENCH RIVIERA.—As already announced a medical tour is being organised by the Société Médicale du Littoral Méditerranéen from Dec. 27th to Jan. 7th. The itinerary includes a visit to Hyères, St. Raphael-Valescure, Cannes, Grasse, Nice, Beaulieu, Monaco, Monte Carlo, and Mentone. Particulars can be obtained from Mme. Juppé-Blaise, Federation of the Health Resorts of France, 1, Gordon-square, London, W.C. 1.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XII.—TESTS OF RENAL EFFICIENCY.

By G. A. Harrison, M.D.,
CHEMICAL PATHOLOGIST TO ST. BARTHOLOMEW'S HOSPITAL.

I.*—General Considerations: Urea-concentration Test.

Renal function tests, like other laboratory tests, must be regarded as an extension of the clinical examination. If the urine is free from protein, investigations of kidney efficiency are unnecessary. Theoretically, it is possible that gross kidney damage could be followed by complete scarring, and so the renal function might be deficient in the absence of proteinuria. In practice this state of affairs is so rare that it may be regarded as virtually non-existent. Proteinuria having been detected, an examination of the centrifugalised urinary deposit should invariably be made. If there are no cells, no casts, and nothing abnormal in the deposit, the proteinuria may be of no significance (intermittent proteinuria). If the deposit is abnormal, the kidneys should not be regarded as healthy unless subsequent careful and repeated observations have justified such a conclusion.

Tests of renal efficiency are relatively gross; they give results which do not differ from the normal until the damage is extensive, and involves some two-thirds to three-quarters of the total renal tissue. The finding of proteinuria and an abnormal deposit but "normal" renal function tests therefore indicates that renal damage lies somewhere between the zero and the two-thirds or three-quarter stage. Other essential points are: 1. Conclusions drawn from renal efficiency tests only apply on the day of the test; the investigations must be repeated at intervals as guides to prognosis or to treatment. 2. The efficiency tests may give a rough measure of the degree of damage; they give no indication of the cause or type of damage, whether nephritis, tumour, stone, or other lesion. 3. When interpreting reports, the possible influence of non-renal factors—e.g., a failing circulation—should always be considered.

The kidneys have three main functions: (*a*) excretory; (*b*) regulation of osmotic pressure of the blood; and (*c*) regulation of acid-base balance of the blood. Of these three the first is most readily tested, the last two being often influenced also by non-renal factors and requiring relatively more elaborate technique. Many methods have been devised to test the excretory function, but it is only necessary here to mention a few of the simplest and most widely used—viz., the urea-concentration test, blood analysis, and the dye tests.

Urea-concentration Test.

The object of this test, devised by MacLean and de Wesselow, is to force the kidneys to *concentrate* urea by flooding the blood with urea, and by withholding fluids for 8 to 12 hours beforehand.

Technique.

Performance of test in ward or patient's home. Nothing to drink overnight—e.g., nothing after 10 P.M. Next morning, at

5.58 A.M.: Empty the bladder completely. Label specimen "0."
6 A.M.: Drink the dose of urea.
7 A.M.: Empty the bladder again. Specimen "1."
8 A.M.: Pass urine again. Specimen "2."
9 A.M.: Pass urine once more. Specimen "3."

Place each specimen in a separate bottle and label each. The whole of the urine passed in specimens 1, 2, and 3 should be sent. A sample of specimen "0" will suffice.

* Part II. will appear next week.

Breakfast may be taken before or during the test, if desired, so long as it is a "dry" breakfast. No tea, coffee, milk, &c., is allowed. The test may be started at 6.30 A.M. or 7 A.M., or at any other convenient time in the early morning, so long as complete samples of urine are obtained at hourly intervals as in the above example, and so long as all fluids are withheld previously for 8 to 12 hours.

Urea prescription for an adult is:—

℞	Urea	15 g.
	Tincture of orange	1 c.cm.
	Water, to	100 c.cm.

The following dose of urea for children has been found satisfactory in practice.

Age in years.	G. of urea.	C.cm. of above prescription.
12 and over	15	100
8 to 12	12	80
5 to 8	10 (approx.)	70
3 to 5	7½	50
1 to 3	6	40
Under 1	4 (approx.)	25

Laboratory Determinations.—Measure the volume of urine in c.cm. and estimate the percentage of urea in each of specimens 1, 2, and 3. The volumes are measured in order to detect excessive diuresis. The hypobromite method for the estimation of urea is sufficiently accurate for clinical purposes, in that only relatively gross variations in urea concentration have any significance.

Interpretation of Results.

(*a*) *Volume of Urine.*—If the concentration of urea is subnormal, the first thing to exclude is excessive diuresis. The volume of urine should not exceed 120 c.cm. (4 oz.) in the first hour or 100 c.cm. (3½ oz.) in the second and each subsequent hour. If the volumes do exceed these amounts, a low concentration is *not necessarily* indicative of deficient renal function, and it is advisable to repeat the test. Excessive diuresis is most commonly due to imperfect preparation for the test. Occasionally, in spite of withholding fluids for 8 to 12 hours previously, there may be excessive diuresis owing to release of water previously retained in the tissues. It is merely a matter of convenience whether the test be repeated on the same or on another day, there being no objection to giving a second dose of urea two or three hours after the first. If the urea concentration be good in spite of excessive diuresis there is obviously no need to repeat the test.

(*b*) *Concentration of Urea.*—The information required is the maximum concentration of urea. It does not matter whether this occurs in the first, second, or third hour. Usually the maximum is found in the second or third, but occasionally in the first hour. Normally, the maximum concentration exceeds 2·5 per cent., frequently being greater than 3 per cent. Figures between 2·5 and 2·0 per cent. may be regarded as within the boundary zone. Their significance should be carefully assessed in the light of all the evidence available, and if any doubt remains as to the efficiency of the kidneys further tests should be performed—e.g., an estimation of the blood urea. Figures below 2 per cent. generally indicate renal inadequacy, always assuming that the test has been properly executed.

Value of the Test.

On account of its simplicity the test has been used extensively in all branches of urinary disease. It is very useful in clinical work, and undoubtedly will reveal the presence of a serious degree of renal inefficiency in the vast majority of cases. There are, however, a few conditions in which it is apt to be misleading at first sight. Thus, in the purely hydræmic type of nephritis with chloride retention, but no nitrogenous retention, it gives normal results, and yet the patient may be at death's door. Again, in some cases of enlarged prostate the urea-concentration test has been normal before operation, and yet the patient has died from septicæmia or toxæmia 24 or 48 hours after prostatectomy. The test is a measure of the efficiency of nitrogenous excretion,

and of that only. We have no right, therefore, to expect it to give warning of septic complications.

The urea-concentration test is a provocative test. That is to say, by flooding the blood with urea an attempt is made to provoke the kidneys to excrete urea at higher concentrations than on an ordinary diet. It is possible that in a damaged kidney such provocation makes a call upon some of its "reserve." Possibly for this reason the urea-concentration test is more sensitive than many others, such as the blood-urea test. But that it is a comparatively gross test was shown by a case in which the urea concentration was perfectly normal, although one of the kidneys had been removed following a street accident. It would appear, therefore, that more than half the renal tissue may be functionless, and yet this test will yield "normal" results.

Special Articles.

THE UNIVERSITY OF LONDON: THE NEW STATUTES.

By PERCY M. WALLACE, M.A. OXF.

II.

THOSE readers of THE LANCET whose attention I may have had the good fortune to retain throughout the perusal of my three preceding articles (of September 24th and October 1st, 1927, and last week) will not have failed to perceive that the duties imposed on the Commissioners of 1898 and 1926 respectively differed very considerably. In the former case it was as though a sturdy youth, having skipped the difficult period of adolescence and attained manhood at one stride, had to be forthwith furnished with an entirely new suit. In the latter the man, twenty-eight years older, had justified his earlier sudden transformation, and was on the whole well content with his equipment, but his friends had observed that in some respects he moved constrainedly and was unable to do himself full justice; his suit must therefore be let out here and the linings strengthened there, and he must be further supplied with an additional cardigan for the better protection of his chest.[1] In less frivolous language, whereas the earlier Commissioners had to design a constitution and government almost from a new beginning, the later, working upon the organisation established by their predecessors, were called upon to enlarge its scope, to ease its methods, to re-dispose its material, and to re-adjust its machinery, with a special eye to the improvement of its financial administration.

My task in the present article will therefore be to indicate directly, with such comments as may appear helpful, those amendments of the constitution of 1900 which, in general conformity with the instructions of the Act of 1926, the Commissioners have embodied in the Statutes which they sealed on July 23rd, and which will come into operation as soon as they have been approved by the Privy Council.

They commence by declaring the "purposes" of the University to be "to hold forth to all classes and denominations, both in the United Kingdom and elsewhere, without any distinction whatsoever, an encouragement for pursuing a regular and liberal course of education; to promote research and the advancement of science and learning; and to organise, improve and extend education of a University standard." This definition is repeated from that provided by the Statutes of 1900, except that the final clause formerly ran:—"to organise, improve and extend higher education within the appointed radius." The amended phrase recognises that not all "higher education" falls within the province of a University; and by the omission of the concluding four words effect is given to the opinion of the Departmental Committee of 1924 that no area need be statutorily defined. As I indicated in my article of September 24th, 1927, there are at present three areas for different purposes of the University—two precise and one vague; this is a cumbrous complication, and the University may well be trusted to handle with common sense any matters upon which the question of area or distance may arise.

His Majesty in Council remains the Visitor, and the Chancellor, appointed by Convocation, the "Head" of the University. The Vice-Chancellor will continue to be elected yearly by the Senate, but this body will no longer be limited to election from within its own membership. The removal of this restriction was specifically recommended by the Departmental Committee on the ground that there might be occasions when no member of the Senate was peculiarly qualified to hold the post, or, being so qualified, was able or willing to devote the time necessary for the effective discharge of its duties. It is this extension of eligibility, we may presume, which has made compulsory—what has hitherto been only permissive—the annual appointment of a member of the Senate to act for the Vice-Chancellor in case of his temporary illness or absence.

The Principalship is also for the first time made a statutory office. Under the moribund constitution the Senate were empowered to appoint a "Principal Officer," not necessarily one of themselves, "to assist in the general government of the University," with "such title, powers, duties and salary" as they might determine; alternatively, they might assign such powers, duties, and salary to the Vice-Chancellor. From the very first it was obvious that in so huge and complicated an organisation no man could adequately perform at the same time the presidential and ceremonial duties and those attached to the control of a numerous administrative and financial staff. At the earliest possible moment after the reconstitution of 1900 a Principal was appointed as a whole-time salaried official, and, except for the period 1915–20, when owing to the stringency of War conditions the office was put into commission, this arrangement has continued down to the present time. From the year 1920 onwards the formal title of the incumbent has been "Principal Officer"; this awkward and occasionally ridiculous anomaly has now been swept away without remark, and the old designation, as known to other British Universities, receives authoritative re-establishment. The Principal is to be the "chief administrative officer of the University," responsible, under the decisions of the Court and the Senate, for the organisation and conduct of its financial and administrative business. He will be an *ex officio* member of the Senate and of all its Standing Committees, but is debarred from membership of the Court and of the governing body of any School. It will be his "right and duty" to advise the Court and the Senate on all matters affecting the policy, finance, government and administration of the University, with unrestricted rights of attendance and speech at Meetings of all bodies, executive or advisory, charged with the consideration of these matters, and authority over the staffs assigned to them. The present Principal Officer is to be the first holder of this reconstituted and enlarged office, with a salary at least equal to that attached to his original appointment.

So much for the chief officials. We now come to the bodies to which will be entrusted the government and administration of the great machine.

I referred just now to the "Court." This term, however, does not designate a body similar to those that generally bear the title in modern English Universities. As I stated last week, the Departmental Committee of 1924 pronounced definitely against the proposal made by the Haldane Commission that there should be a large body, of "about 200" members, in supreme control, specially charged with ceremonial and legislative functions. It is to the small body

[1] The paronomasia was not intentional, and I hope I shall be pardoned for letting it stand—an unconscious but not unhappy echo of the picturesque archaic terminology of my own University.

concerned solely with finance, for which the Committee suggested the title of "Council," that the Commissioners have transferred the more exceptional designation of "Court."[2] This body is to consist of 16 persons—the Chancellor, the Vice-Chancellor, the Chairman of Convocation, six persons appointed by the Senate from their own number, four appointed by His Majesty in Council,[3] two by the London County Council,[3] and one co-opted by the other 15 members. Appointments will normally (*i.e.*, as soon as the Court has got definitely into its stride after the necessarily shorter tenure of most of the original members) be for five years. The Court will elect its own Chairman. It is to have "the custody, control and disposition of all the property, funds and investments" of the University, with full authority in respect of leases, loans, and contracts. It will be in control of all financial matters, with "power to determine finally any question of finance arising out of the administration of the University or the execution of its policy," subject to the proviso that, before determining any question of finance which dirctly affects educational policy, it must take into consideration the views of the Senate thereon. It is to be responsible for all measures "necessary or desirable for the conservation or augmentation of the resources" of the University, and is to check action or liability accordingly. It is to represent the University in all negotiations for grants from public bodies, and without its consent no School (except in the Faculty of Theology) is to be permitted to receive such grants, make public appeals for money, or accept benefactions which might in its opinion become onerous. It is to "determine the allocation of all funds at the disposal of the University," with the stipulation that, in respect of the Senate's own "central activities" (under suitable heads and sub-heads) and the expenditure by Schools "as part of their general income," recurrent grants are normally to be allocated in the form of block grants; and is also to appropriate at its discretion funds for the maintenance of the property of the University and of an adequate staff for its financial and administrative business. To enable it to carry out these duties fully and effectively, the Court is to be entitled to ask for any information it considers necessary from any body or official in the University and from the authorities of any School, and to prescribe the manner, form, and periodicity of all Accounts and Estimates.

The considerations which led the Departmental Committee to recommend the entrustment of financial supremacy to this new body were indicated last week, together with arguments that have been put forward in opposition. It only remains, in summarising more precisely the terms of reference to the Court embodied in the new Statutes, to repeat the confident expectation that, in spite of the unreasonableness urged by its opponents, the scheme will not creak unduly in the working, still less give birth, through lack of intelligent sympathy and good will on both sides, to a succession of embittered deadlocks. It may be presumed that in practice the procedure will be analogous to that which has for many years been observed under the obsolescent constitution—that no recommendation involving fresh expenditure will be submitted to the Senate by any Committee until it has received the approval of the Court, or, as may occasionally be found necessary, that any such resolution of the Senate will be specifically subject to such approval.

The Senate, though deprived of the ultimate control of finance, will remain the "supreme governing and executive body of the University in all academic matters," and except for that limitation (which, as has been suggested, may prove to be more in seeming than in substance) are charged to "take such measures and act in such manner as shall appear to them best calculated to promote the interests of the University as a place of education, learning and research." The constitution of this body is to differ in several respects from that prescribed for it in 1900. The Chancellor, Vice-Chancellor, and Chairman of Convocation remain, and, as already indicated, the Principal is to be added as a fourth *ex officio* member. Next in order are placed "the Heads [these generally bear the title of Principal] . . . of the following Schools"[4]:—University College, King's College, Bedford College, Birkbeck College, East London College, the Imperial College of Science and Technology, the London School of Economics, the Royal Holloway College, and Westfield College, provision being made, in the event of any of these ceasing to be a School, for the substitution of another School should the Senate consider this course desirable. Under a special separate clause, the two first-named Colleges are—in recognition, presumably, of their longer history and more comprehensive purview—to retain their exceptional representation on the Senate. In addition to their respective Heads, there is to be a member appointed direct by the University College Committee and one by the Council of King's College. It is to be observed, however, that the latter is the governing body not of the College as the term is generally understood (*viz.*, the original foundation without its Theological and its Advanced Medical Departments), but of its Theological Department, which, as has been already explained, stands now on its own feet as a School of the University in the Faculty of Theology, and has since the administration of the other Departments of the College was taken over by the University enjoyed the right of appointing a member of the Senate. The two prerogative institutions are thus to retain in a re-adjusted and not logically defensible scheme the special representation granted them by the Statutes of 1900, University College henceforth sending its Provost and an appointee of its Committee, and King's College its (secular) Principal and an appointee of its (theological) Council. Then come 17 representatives of Convocation; of these there are on the present Senate 16, the difference being due to the diminution by one of the graduates in Science and the addition of one each of those in Engineering and Economics—two categories that did

[2] No explanation is given of this alteration in nomenclature, but it is not difficult to conjecture to what considerations it was due. As will be made plain in the following paragraphs, the Court will stand *sui generis*, controlling finance, and in this province supreme. The Senate will be supreme in all academic matters, and will be advised by five Standing Committees, each known as a Council. Behind these will be the Faculties and Boards of Faculties, and behind them the Boards of Studies. Each rank in the hierarchy will thus have a distinct generic title of its own. The convenience derived from this obviation of natural misunderstandings in an intricate organism will be, in actual practice, very great. In the constitution of 1900 the University Extension Board stood correlative with the Academic Council and the External Council, but its title sometimes obscured this status through a mis-association with that of the Boards of Studies. A suggestion was recently made to re-name the two Councils the Academic "Board" and the External "Board" respectively; this would certainly have effected the due ordinance of the three chief Committees, and left the field clear for the Council (*tout court*) as the financial authority; but increased confusion with the Boards of Studies would have been in daily commerce an incessant source of irritation—far more serious than would be easily comprehended by those who have not been constantly concerned with the operation of so delicate a mechanism.

[3] The Treasury and the London County Council are the two largest channels of public financial support for the University.

[4] Constitutional purism may properly demur to the comprehension of University College and King's College in this category, as also to the special extension of the term "governing body" to include the University College Committee and the King's College Delegacy. Upon incorporation in the University both these Colleges surrendered their independent existence and autonomy, and came under the control and administration of the Senate, the immediate supervision of the work of each being, as I explained before, entrusted to one of its Committees acting on the spot. But the Commissioners were in this regard bound by the specific declaration in the Act by which they were appointed that the term "governing body" was applicable to these two Committees; after that it would have been almost an affectation to refuse to the two Colleges the title of "School." From the point of view of practical convenience there can be no doubt that their inclusion in the terminology applied to the normal Schools is, however irregular constitutionally, an innovation of manifest advantage.—It may be noted, as a survival of the former indication of their peculiar status, that these two institutions are still officially designated "University of London, University College" and "University of London, King's College" respectively, in contradistinction to the style "Guy's Hospital Medical School (University of London)," "Westfield College (University of London)," formally prescribed for the normal Schools in the several Faculties.

not exist at the date of the promulgation of the Statutes of 1900. The number of Faculty members, otherwise remaining unaltered, is also increased to 17 by the allocation of an additional representative to the Faculty of Engineering—in recognition, no doubt, of the development of its work during the past twenty-eight years and its obvious division into the two branches of Civil and Mechanical Engineering and Electrical Engineering.

Such of my readers as have not already learnt the facts from another source will at this stage have observed with dismay that no Medical School appears in the foregoing list of the Schools that are to be represented on the Senate by their respective Heads. This category is confined (except in the case of Westfield College) to such Schools as have been admitted in two or more Faculties, and have thus a larger institutional stake in the University than the one-Faculty Schools in Theology and Medicine. But these two classes are manifestly not on a level in being so described. Theology may fairly be regarded as one subject. But the organisation and control of medical education occupies so prominent a position in the history and structure of the University, and is concerned with so varied and extensive a *clientele*, that the Commissioners have specially allotted to the General Medical Schools,[5] acting in common, two representatives on the Senate, to be elected from among themselves by their own Deans (or other "chief executive officers"); moreover, in the event of one of the first-named nine Schools falling out and no other School being substituted for it, the Senate are specifically empowered at their discretion to fill the vacancy so caused by increasing this joint representation of the General Medical Schools from two to three. This representation is, of course, in addition to the three Faculty members who are continued from the scheme now on the eve of supersession. Thus on the new Senate there will be two representatives of the graduates in Medicine, three of the Faculty of Medicine, and two (possibly three) of the General Medical Schools which are for the time being Schools of the University. The membership is to be completed by the co-optation by the rest of four (in certain circumstances five) more persons, not necessarily members of the University.

Such are the retentions on and additions to the Senate. The bodies which lose representation are the Crown, the Royal Colleges of Physicians and Surgeons, the four Inns of Court, the Law Society, the Corporation of the City of London, the London County Council, and the City and Guilds of London Institute. With regard to these it may be remarked that the four Crown members and the two County Council representatives will now have their place on the Court; the co-operation of the Royal Colleges, each of which sent two members, and of the Corporation and the City and Guilds Institute, each of which sent one, highly valuable as it was in 1900, is not essential now that the University has "found itself" and can walk alone: and the disappearance of the Inns of Court and the Law Society seems a natural consequence of the failure of the legal profession to co-operate with the Senate in the establishment of a great School of Law within the University, as mentioned by me in September, 1927. On the general question it may be presumed that the Commissioners have acted upon the opinion expressed by the Departmental Committee that there is "no justification for the system whereby so many Senators are nominated by bodies none of which has an organic connexion with the University and most of which have no similar privileges in other universities." The total membership of the Senate will thus be 54 (or 55 if the Vice-Chancellor is elected from outside); this is a larger number than that recommended by the Departmental Committee, who had urged a reduction from the existing 56 to 49; but the Commissioners have been led to prescribe the increase by their conviction of the urgent desirability of providing for ample representation, not only of the graduates and the teaching staff, but also of the chief administrative units within the University. Apart from the 13 who occupy their seats by virtue of their positions, members will normally hold office for four years.

The Senate will be "supreme . . . in all academic matters," and is authorised to delegate any of its powers to any Standing or other Committee, with or without power to such Committee to sub-delegate such powers to any subordinate Committee. It may be presumed that, until it has thought out a coherent scheme of delegation, it will continue the present practice of receiving Reports from its Committees and adopting definite resolutions after consideration of the reasoned advice thus put before it.

There are to be five Standing Committees, the membership of each of which is in greater or less degree governed by Statute, the completion lying in the hands of the Senate, who are not confined in their appointments to members of their own body.

Priority of place is, as hitherto, accorded to the Academic Council, which will consist of the Vice-Chancellor, the Principal, the 17 Faculty members, and nine other persons appointed annually by the Senate, who in making these appointments are to have regard, *inter alia*, to "subjects of study and academic interests not otherwise represented" on the Council, and to take into consideration any views laid before them by any Board of Faculty, Board of Studies, or other analogous body. This Council is to advise the Senate, and where authorised to take executive action, in respect of the various matters that fell within the purview of its predecessor—the admission of Schools; the establishment, duties, and remuneration of Professorships, Readerships, and Lecturerships "of the University"; the recognition of Teachers; degrees, curricula, and examinations for Internal Students, and academic work generally. It will also be concerned with the constitution and *personnel* of Faculties, Boards of Faculties, and Boards of Studies, and with the regulation and co-ordination of their work.

The External Council is to consist of the Vice-Chancellor, the Principal, the 17 Convocation members, and nine other persons, in whose appointment the Senate are to have regard, *inter alia*, to "the adequate representation on the Council of the views of public educational institutions at which substantial numbers of students follow courses of study for the External degrees of the University"; this novel feature should prove most beneficial if it keeps the Senate in touch with the conditions and experience of the provincial Colleges and other institutions "not carried on for private gain or profit" which are vitally concerned with the special problems of this department of their work. To this Council the Senate will similarly look for advice and action regarding External Students—their degrees, diplomas, syllabuses, facilities for study, guidance, and examinations.

We then come to the second of the main innovations introduced by the Commissioners in pursuance of the general policy of the Departmental Committee—the Collegiate Council. This body is to consist of the Vice-Chancellor, the Principal, the eleven (or more) Heads or chief executive officers of Schools who have seats on the Senate, together with "so many additional members as the Senate may from time to time determine to represent Schools or groups of Schools not already represented on the Council, such additional members to be, in the case of a single School, the Head of that School, and in the case of a group of Schools the Head of one of the Schools in the group to be elected by the Governing Bodies of the Schools in the group acting through their Heads." The chief duty laid upon this Council is to advise the Senate upon what the Departmental Committee described as "institutional and inter-institutional matters." The primary items of this category, as set out in the new Statutes, are the

[5] These are still, as in 1900, twelve in number, and need no specification in these columns. (For other—i.e., non-"General"—Schools in the Faculty of Medicine see footnote 8 below.)

"appropriate and adequate share" to be taken by each School in the teaching work of the University and the most advantageous distribution among the institutions of teachers, equipment, and facilities for teaching and research; and special stress is laid upon co-operation for the provision of common courses of instruction, common examinations, and common facilities for original study and research and the interchange of teachers and students, and upon the organisation and extension of favourable conditions for social intercourse and recreation and the maintenance of "a high standard of conduct" among students. These objects are plainly of paramount importance if the University is to become in the amplest sense of the term an organic unity, having its work co-ordinated for the general advantage and its various resources conveniently, effectively, and economically utilised. There has hitherto been no statutory provision for the representation on the Senate or any other central body of any School other than University and King's Colleges, and even these have not necessarily been represented by their administrative Heads. Some other Heads of Schools and Institutions have from time to time been appointed to the Senate by the Crown or by one of the Faculties or by Convocation. But this indirect and accidental method is not adequate. Still less is the requirement met by the only occasions for conference among members of the several Schools actually provided by the existing Statutes—the meetings of Teachers on Boards of Studies and Faculties, for these are concerned only with such details as lie within the narrow limits of isolated subjects or hardly less isolated groups of cognate subjects. Such opportunities as Heads of Schools have hitherto enjoyed for the comprehensive and responsible discussion of the larger aspects of organisation and co-operation just enumerated have been those occasionally afforded by their own voluntary and uncorrelated efforts. Much therefore may be expected from this statutory recognition of a grave deficiency and provision for its redress. One example of what can be achieved in this direction is supplied by the partial adoption, to which I referred in my article of October 1st, 1927, of he scheme recommended by the Statutes of 1900 for the concentration of preliminary and intermediate medical studies.

Of the other two Standing Committees instituted by the new Statutes, the University Extension and Tutorial Classes Council and the Matriculation and School Examinations Council, it would not be relevant to say more in these columns than that they are charged, under re-adjusted organisation, with the supervision of those branches of the work of the University which are indicated by their respective titles—the former with what is known in another place as "extra-mural" study, the latter with the various avenues of entry to the University and the inspection and examination of secondary schools.

In addition to these five Committees of prerogative rank, the Senate will have power to constitute others at its discretion. Of this nature there were during last Session (excluding the Finance Committee and others whose work will now be otherwise provided for) no less than 25, dealing with such special subjects as the Goldsmiths' College, the Institute of Historical Research, the Diploma for Journalism, the Library, Military Commissions, Scholarships, Establishment and General Purposes, and so forth.

The eight Faculties remain as hitherto, except that it is definitely provided that every fully recognised Teacher shall henceforth be assigned to one or more, though (as at present) no person will be entitled to vote in more than one at Senatorial elections. They will continue to be available for consultation by the Senate or any of its Committees upon any matter at their discretion, but without any compulsion so to consult; and they will retain their present right to report of their own motion upon a number of subjects in which they are respectively interested. That this right has under the obsolescent Statutes been comparatively rarely exercised has been in some cases due to their cumbrous dimensions. For this special defect a remedy is now provided. The voluntary and tentative institution by the Senate a few years ago of Faculty Boards is now to be formally incorporated in the fabric of the University. The Senate are directed to appoint a Board of Faculty (as the title will run henceforth) for each of the Faculties of Arts, Medicine, and Science by name, and normally ("unless for special reasons they otherwise determine") for any other Faculty in which there are more than one Board of Studies; there may even be one appointed for any Faculty in which there is only one. It is not easy to predict with confidence the exact effects of an instruction so confusedly permissive; but, as the assignment of Boards of Studies to Faculties now stands, we may reasonably expect that in the near future only two (at most three) Faculties will remain without a Board of Faculty—those of Laws and Music (and possibly Theology), for, if variety of subject is to be taken as the criterion, it is not clear on what principle either Engineering or Economics should be excepted from the normally compulsory clause. It may be remembered that last October I mentioned that the Faculty Boards had been in some quarters regarded as an unnecessary complication of the academic machinery; now that they are to be invested with statutory authority and definite functions, they will of course enjoy an enhanced prestige. The business of each will be to advise the Academic and External Councils upon a number of matters within the purview of its Faculty—the scope and correlation of courses of study and examinations, the provision for teaching and research, the conditions of graduation and the award of certificates and diplomas, the *personnel* of Boards of Studies, and any other matters that may be referred to it. Each will consist of the Dean of the Faculty, all members of the Senate who are "members of or graduates in the Faculty,"[6] one representative (when the Senate think it desirable, two or more) of each of the comprised Boards of Studies, and not more than five other members of the Faculty to be appointed by the Senate on the nomination of that body.

In view of the range and importance of those matters in which the Academic Council at least will require the frequent assistance of these Boards of Faculties, and of the exceptional unwieldiness for regular consultation of the Faculty of Medicine with its present membership of over 400, it may be profitable at this point to consider how under the new regime the constitution of the Board of this Faculty will actually work out. The Dean and five to eight Senators will have seats *ex officio*. At the time of writing (and there is no reason to anticipate any noteworthy alteration in this matter) there are nine Boards of Studies within the Faculty—those of Preliminary Medical Studies, Intermediate Medical Studies, Advanced Medical Studies, Dentistry, Pharmacy, Hygiene and Public Health, Physiology, Human Anatomy and Morphology, and Pharmacology; in view of the comprehensive character of some of these, it may be presumed that the members under this category may number from 14 to 16. Then there will be from seven to nine of the members of the Senate (duplication will plainly be avoidable in normal cases); and there may (probably will) be five others. This gives a total membership of about 35—a number large enough to include for most purposes all specialised interests even in a Faculty

[6] In this phrase we find statutory warrant for that ambiguous signification of the word "Faculty" which has occasionally given rise in the terminology of the University to a considerable degree of misapprehension—not to say exasperation. Its primary, and according to the framers of the Statutes of 1900 its only strict, usage during the last twenty-eight years has been to designate corporately those individually selected Teachers who have been admitted by the Senate to membership of one or more of the eight electoral and in a limited degree advisory bodies bearing that title, as indicated above. In this Statute the term is also used—so conveniently as to be almost inevitably—to signify that department of undergraduate or post-graduate study within the University which in the case of successful students leads to a distinctive degree. There are of course other meanings of the word in other Universities—and in popular phraseology.

of such wide content, and yet not too large to preclude the probability of the regular attendance of a predominant proportion of the same persons—a most desirable feature in a body of this function. In this respect Medicine will share with Engineering (with four Boards of Studies) and Economics (with nine) a favourable position between Arts and Science (with 21 each) on the one hand and Theology (with three) and Laws and Music (with one each) on the other—for it is not only in the domain of logic that intension varies inversely with extension. If, as seems beyond question, these Boards of Faculties become a vital element in the academic structure, it is probable that, while such bodies as the Committee of the Medical Members of the Senate (to which the Departmental Committee referred slightingly as redundant, ill-conceived, and possibly unconstitutional) will cease to exist, the Faculties themselves will, save on exceptional occasions, be more and more limited in actual practice to their original function of periodically electing to the Senate the representatives of the teaching staff of the University.

The province of the Boards of Studies (at the present time 45 in number) remains generally the same as hitherto, except that the wording of the obsolescent Statutes specifically forbidding the Academic Council or the External Council to advise the Senate upon "any matter relating to courses of study, provision for teaching or research, examinations and the appointment of Examiners, or the granting of degrees or certificates of proficiency" without first taking the opinion thereon of the relevant Boards has been modified both in absoluteness of tone and in scope of application. But this does not really indicate any sacrifice of safeguards—it is merely a recognition that the Senate can be trusted in the matter of common sense. The normal procedure under the old dispensation will not be materially affected in any sense adverse to the dignity or authority of the Boards; they will continue to be consulted on all technical points, but there will no longer be the tiresome delays that have from time to time held up urgent business until some Board should have reported on some detail of procedure. On the other hand they may in future be called upon, within their respective spheres, to advise not only these two Councils but also any other Committee of the Senate (Standing or otherwise) or Board of Faculty, or even the Senate itself direct. The number of the Boards, which are to be appointed annually, is left to the discretion of the Senate; probably there will be no great change in the present Register. With regard to *personnel*, it is now specifically prescribed that, where practicable, each Board must include all the Appointed Teachers of its own subject or subjects and some of those of cognate subjects, also Recognised Teachers of and "other persons"[7] expert in such subjects or cognate subjects—the number in these two categories taken together not to exceed that of the Appointed Teachers.

The conditions that will govern the examinations for and the conferment of the several degrees are set forth in terms that, generally speaking, incorporate in the existing code such adjustments as the accumulated experience of the last twenty-eight years has shewn to be expedient. These do not require detailed analysis here, and it will be sufficient to mention, for such readers of THE LANCET as may not be aware of the fact, that, although it is under present conditions incredible that the Senate should ever desire to confer (as they technically may) the degree of Doctor of Philosophy in the Faculty of Medicine, they have added two to the traditional four (M.B., B.S., M.D., and M.S.) to which in that Faculty they were limited by the Statutes of 1900—those of Bachelor of Dental Surgery and Bachelor of Pharmacy, for the institution of which the approval of His Majesty in Council was obtained in 1921 and 1925 respectively.

Similarly, and finally, those of the new Statutes that deal specifically with the Schools of the University and its Teachers (Appointed and Recognised) do little more than consolidate the Statutes of 1900, as interpreted and expanded since that date by amendments designed to meet successive needs. Two points may, however, be noted as of characteristic interest. The first is the formal adoption of the system of Boards of Advisors as an integral feature of the process of "appointing" Teachers or of conferring the status or title of Professor or Reader—a merited tribute to the marked success that has crowned this device, of which I gave some account last October. The second must afford even livelier satisfaction to those who have striven and are striving to get the best possible work out of the machine entrusted to their hands. Among the further conditions upon which henceforth the Senate must statutorily satisfy themselves before admitting any institution to the grade of School[8] are the willingness of its governing body to leave in the hands of the University the conferment of the status or title of Professor or Reader upon members of the staff and to observe its requirements with regard to appointments to the higher teaching posts, the extent to which the teaching staff may take part in its management, and the adequacy of the provision made for recreation and corporate and social life. The relations of the University with its several Schools, and with the members of the staffs appointed by them both prior to the reconstitution of 1900 and since that date, have been of necessity so delicate, and grave divergences of view might so easily have arisen in regard to rights and privileges, that what we may take to be this agreed stabilisation on more intimate lines of a system honourable and profitable to all parties must be regarded as of most hopeful augury. It is, indeed, manifest that without such mutual confidence and genuine co-operation between the University and its Schools the experiment inaugurated twenty-eight years ago must have failed to realise the aspirations of those who devised it. That this central feature of the organisation should have proved susceptible of harmonious and equitable operation must be most gratifying and encouraging to all who wish well to the University.

For fuller details of the revised constitution those interested will consult the Statutes themselves. My part in this and the three preceding articles has been to indicate in outline, with illustrations mainly drawn from the medical department, how prolonged and how devoted have been the efforts of some of the keenest and most expert authorities in the country to solve a long-standing problem—*quantae molis* has been the endeavour to equip the capital of the Empire with a University worthy of her exceptional wealth in academic material and potentialities.[9]

[7] It may be presumed, though it is not precisely stated, that this phrase does not include members of staffs of Schools or Institutions that have *not obtained* recognition as Teachers, but designates experts who, having no such association with the University, are able and willing to assist its work by accepting appointment to its Boards of Studies.

[8] In addition to the twelve "General Medical Schools" (and University College and King's College in respect of preliminary and intermediate medical studies), the following are at the present time Schools of the University in the Faculty of Medicine (in some cases only for certain subjects or for limited periods):—the London School of Hygiene and Tropical Medicine, the Lister Institute of Preventive Medicine, the Royal Army Medical College, the Royal Dental Hospital and School of Dental Surgery, the Naval Medical School of the Royal Naval College (Greenwich), the Maudsley Hospital, Bethlem Royal Hospital, the School of Pharmacy, and the Cancer Hospital. There are a number of other Institutions at which there are Recognised Teachers in subjects comprised within the Faculty.

[9] In view of the special character of the *clientèle* of THE LANCET, I trust I may be allowed, in a final footnote, to call attention to a remarkable fact in connection with the tenure of the Vice-Chancellorship during the past twenty-seven years—that is, since the Senate were first able to exercise their free right of election (the first Vice-Chancellor under the existing Statutes having been appointed by the Statutes themselves). Election to this office has been annual, and the Senate have been obliged to elect one of their own body. Although the direct representation of Medicine on the Senate has been only nine out of a total membership (excluding the Chancellor) of fifty-five, the choice has fallen upon a Physician or a Surgeon on seventeen occasions out of the twenty-seven. From 1911 to 1924 the medical profession had an unbroken run.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Instruction in Sexual Physiology.

THE Edinburgh education authority has come to certain provisional and rather hesitating findings on instruction of children about the physiology of reproduction. The essential findings of the authority are:

(*a*) That a special meeting (or meetings) should be held once a year of parents of children above 12 years of age, other than those attending the transferred Roman Catholic schools.

(*b*) That a short list of pamphlets be drawn up and approved for the use of headmasters, teachers, and parents. Such pamphlets to be available for sale at the meetings, but not to be issued to the children.

(*c*) That should any parents express a desire for such instruction to be given to their children, it should be done only by such members of the teaching staff as are willing to do so, and in the opinion of the headmaster qualified, or by one of the medical staff—the instruction to be given in all cases by a person of the same sex as the child. No class instruction shall be given.

Prof. J. Y. Simpson, a member of the authority and himself a distinguished teacher of biology, suggested that biology should be taught in secondary schools, and in relation to (*c*) entered a caveat against the policy of limiting the kind of instruction and the types of person that should convey it. The decision of competence to teach in this field ought not to lie with the headmaster. The special committee concerned, it appears, considered "that the responsibility of imparting information as to the origin of life lies with the parents," and this is approved by the Committee on Religious Instruction. "At the moment it does not seem likely," the special committee continues, "that the primary schools will ever provide direct instruction in sex hygiene—at any rate, it cannot be given until public opinion recognises sufficiently the necessity for such instruction and exhibits confidence in the ability of responsible advisors of children to give the instruction needed." The committees display no sign of the suspicion that the vast majority of parents are too ignorant of sex hygiene to undertake, with safety, this work, even if there were not between father and son, or between mother and daughter, that well-known barrier of reticent delicacy in all matters of sex.

Pensions for Nurses.

In connexion with the Federated Superannuation Scheme for Nurses and Hospital Officers, a meeting of representatives of voluntary hospitals in Scotland was lately held at Glasgow. It was pointed out that a nurse, while she was working, had very little opportunity of saving anything, and there was an obligation on the community, who owed so much to her, to see that when the time came for her to cease working there should be some provision which would help her to live in comfort. The Federated Superannuation Scheme was a contributory scheme. It was national in its character, and had been framed to meet the needs of all hospitals, irrespective of their size. It was framed on the general lines of the federated superannuation system for universities. This scheme had the advantage that under it a nurse had the option when the retiring age came of receiving either a lump sum or an annuity for the remainder of her life. Moreover, if she so desired it, the benefit could take the form of an endowment insurance. The scheme was worked by means of assurance policies issued to each individual by well-known life assurance associations, so that there could be no doubt of its solvency at any time. One of the principal objects of the scheme was to provide that when members moved from one hospital to another they should carry their policies with them.

The Universities.

Prof. F. G. Banting, of London, Ontario, delivered on Oct. 31st his Cameron Prize lecture to a large audience of students and medical graduates at Edinburgh. Prof. Banting, who was awarded the Cameron Prize of 1927, told the story of his researches in detail and recounted the various experiments which led up to the discovery of insulin.

Mr. Thomas William Drinkwater, Ph.D., was recently entertained at dinner by the Royal College of Surgeons of Edinburgh, in honour of having completed 50 years as a lecturer in the School of Medicine of the Royal Colleges of Physicians and Surgeons. Sir David Wallace, presiding over a company including some 40 fellow lecturers and colleagues in the School of Medicine, said it was a unique event that a lecturer should have continued to hold classes for so long a period. After completing his medical studies at St. Thomas's Hospital, London, and at Edinburgh, Dr. Drinkwater qualified as L.R.C.P. in 1878 and almost immediately took up lecturing on chemistry. Besides conducting large classes, he was one of the earliest chemists to do analytical work in connexion with the public health movement, and he is still actively engaged in teaching and in chemical analysis for medico-legal work. He is a Fellow of the Royal Society of Edinburgh and of the Institute of Chemistry.

It is stated that of the 3978 students from outside the British Isles at British universities, Edinburgh has the highest number, 574, Cambridge being second with 546, Oxford third with 507, University College, London, fourth with 312, and Glasgow University fifth with 190.

The Problem of the Feeble-minded.

Dr. R. D. Clarkson, of the Royal Scottish National Institution, Larbert, lecturing to the City of Glasgow Society of Social Service on Nov. 9th, pointed out that mental deficiency was extremely difficult to define and the definitions in the Mental Deficiency Act were not helpful. The highest grade defined in the Act was that of the feeble-minded who were said to require supervision and control for their own protection, or the protection of others. In the case of children, the feeble-minded were those who were incapable of obtaining proper benefit from the ordinary instruction in elementary schools. It was agreed that about 1 per cent. of the children in the schools did not derive benefit, and on this basis it would seem that there should be about 50,000 in Scotland; but the number known to the General Board of Control was only about 3000. It was practically certain, however, that incapacity at school did not necessarily mean incapacity to earn a living in later life. Mental deficiency might arise—e.g., from disease or injury—in any family, and no distinct line could be drawn between the mental defective and the normal member of the community. It was probable that heredity did not account for a very large proportion of defectives. There was far too little institutional accommodation for defectives in Scotland, said Dr. Clarkson. Of the 3000 known to the General Board of Control about 1800 were in institutions, and of these only 634 were in institutions for adults. Experience at Larbert seemed to show that every training school for defectives should have an industrial colony in connexion with it under the same management, because defectives transplanted badly.

Dental Benefit.

In the third of a series of popular health talks at the Edinburgh Y.M.C.A. hall, Mr. Douglas Radford gave an excellent summary of our knowledge of diseased teeth. He pointed out that nearly every disease is influenced by the mouth being in a condition of suppuration, and often the degree of oral cleanliness decides whether the end of a serious illness is death or recovery. Such teaching should help to awaken interest in the maintenance of dental benefit under the National Health Insurance. At present it is, of course, only an additional benefit, though the dental profession put forward a strong case before the Royal Commission for making it statutory. This was not accepted and the large dental service, involving some £3,000,000 in England and £250,000 in Scotland, with

its Advisory Committee and inspecting and consulting officers, depends entirely on the allocated part of the surplus funds emerging at the last valuation of the approved societies. The allocation covers only five years, and at the end of this period the societies and central authorities will be faced with the alternatives of finding money to continue the service or of dropping it; for it is much less likely than it was that the next valuation will show a surplus equal to the last, if it shows any at all. The last reorganisation of responsibilities put more on the approved societies and less on the State grant. Hence these tears. It is time the profession were taking steps to preserve a service so well begun and recognised on all hands as one of the best developments tried under the Insurance Acts. It is monstrous to think that a service so far-reaching in its effects should be allowed to drop or to diminish merely because the so-called "surplus" may not emerge. Experience has proved that dental benefit and ophthalmic benefit are in very widespread demand, and it will be very poor statesmanship that fails to keep these services in being.

A Point of Law.

A curious point in procedure has arisen in the Lanarkshire Sheriff Court. The county council raised a case in its capacity as executive local authority under the Diseases of Animals Acts, the complaint being dismissed by the Sheriff on the ground that the Procurator-General alone had the right to institute proceedings. The Sheriff holds that, no express right being given to the county council by the Acts in question, none can be implied. It seems to have taken 30 years to make this discovery, which means that the county councils have not been very active. Perhaps the recent reforms in the duties of the Procurators have something to do with it.

The vital statistics of Scotland for the third quarter of the year 1928 show a birth-rate of 19·1 per 1000, a marriage-rate of 7·5, and a death-rate of 11·0.

In a report to the Selkirk education authority, Dr. G. M. Elliott, the school medical officer, says that in the early part of 1928 there was a paratyphoid epidemic in Galashiels. Thirty-six children of school age were affected. All these were affected at the same time, which was easily understood as the epidemic was caused by water infection. There were no deaths among school-children from this disease.

Colonel K. H. M. Connal, chairman of the Glasgow and West of Scotland Society for the Prevention of Cruelty to Animals, has issued an appeal on behalf of Animals' Week, which is being held in the city from Nov. 18th to 24th. Among the many activities of the Society he makes special reference to work among school-children. In the Animal Defenders' Corps, instituted two years ago for children of 10 years and over, nearly 33,000 children have applied for badges of membership.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Medical Certification of Insured Persons.

A SPECIAL meeting of the Irish Medical Committee was held on Nov. 14th, under the chairmanship of Dr. Joseph Power, to consider the proposals of the National Health Insurance Commission regarding an alteration in the method of distributing the funds available for payment for certification of insured persons. As has already been stated in THE LANCET, the Commission wishes to substitute the county for the dispensary district as the area of pool which constitutes the basis of distribution. Sir Joseph Glynn, chairman, and Dr. W. J. Maguire, medical member of the National Health Insurance Commission, with some members of their staff, attended the meeting of the committee, on the suggestion of Sir Joseph Glynn, in order to explain the proposal, and to answer any questions that might be asked. Sir Joseph, in stating his case, explained that the present method of distributing the funds by a dispensary area pool was cumbrous and difficult, and necessitated complicated calculation, so that the expense of distribution was more considerable than was justified unless there were distinct advantages in the present system which could not be retained by any other. He could find no such advantage. On the contrary, as the present method worked out, there were enormous and iniquitous differences in the payment rates for certificates issued. In the County Galway, for example, the rate for certificate varied from 1*s.* 5*d.* in one district to £1 in another. It was not uncommon in many counties to find in one district a rate for certificate six or eight times greater than in an adjoining district. This gross inequality he believed to be due to the fact that there was no accurate method of allotting insured persons to their proper dispensing districts. He had found it impossible to discover an accurate method of allotment or to establish a register of insured persons with their addresses. He understood that some medical men objected to the proposed change, but suggested a modification of his original proposal. He would be willing to take out of the county pools the towns or villages of a population of 2500 and over, and make them certification pools in the same way as urban areas of 10,000 and over are at present. In reply to Sir Joseph Glynn, it was agreed that the present method entailed more complicated book-keeping, but the committee was unable to believe that it was beyond the capacity of the staff of the Insurance Commission, with the help of the approved societies, to devise some method of establishing an accurate register of names and addresses. The objection of the committee to the proposed change was based on the grounds of efficiency. Some, at least, of the present inequality was due, not to inaccuracy in the allotment of the insured, but to laxity of certifying by certain certifiers. This laxity would be deprived of its chief check if the area of pool were increased. With a dispensary area pool, in which, as a rule, only two or three certifiers shared, each acted as a check on the others. But if the area of pool were enlarged so as to become the property of 20 or 30 certifiers, it would be impossible for any of them to exercise any check. A dishonest or careless certifier would largely increase his share at the expense of the careful certifier. Examples were given by several members present that their own receipts would fall by 50 or 75 per cent. On the withdrawal of Sir Joseph Glynn and his colleagues, a long dicussion took place, and the following resolution was unanimously passed:—

"That the Irish Medical Committee decline to recommend the acceptance of the proposal of the Irish National Health Insurance Commission for revision of the scheme for distribution of remuneration for certification of insured persons, as the proposed change is likely to interfere with the efficiency of the certification system, and that the Minister for Local Government and Public Health be requested to receive a deputation from the committee to discuss the question."

Irish Medical Committee.

Some other important matters were discussed at the recent meeting of the Irish Medical Committee. The committee had under consideration a letter from the medical practitioners of the City of Cork, pointing out that the appointment of whole-time medical officers of health for the borough and county was likely to encroach on the rights of medical practitioners generally, and especially those engaged in the work of specialists, for example, in eye, ear, and throat diseases, and orthopædics. The committee resolved:—

(1) That the function of the health authority should be confined as much as possible to the prevention of disease.

(2) That the work of the whole-time officer should be confined to administration and inspection, institutional or consultative.

(3) That health visitors and nurses should be definitely responsible to a local practitioner for patients dealt with by them, including expectant mothers; and

(4) That in the case of patients other than poor persons entitled to gratuitous relief they should be always referred to their usual medical attendant to make arrangement for their medical treatment.

The committee delegated to its executive sub-committee the preparation of evidence to offer to the committee of inquiry on the working of the Local Authorities (Officers and Employés) Act, 1926.

Dublin University College Medical Society.

The opening meeting of the Medical Society of University College, Dublin, was held on Nov. 14th, in the Physics Theatre of the College. Prof. M. R. J. Hayes, President of the Society, read an address on The Rôle of Radiology. He gave a survey of the applications of radiology in diagnosis and treatment in all branches of medicine and surgery. A discussion followed, in which Prof. T. G. Moorhead, Senator H. L. Barniville, Prof. J. M. O'Connor, and Dr. J. B. Magennis took part.

ROYAL SOCIETY OF MEDICINE.

ANNUAL DINNER.

ON Nov. 15th over 400 Fellows of the Royal Society of Medicine assembled to dine well and merrily together and, not least, to hear speeches from a statesman, a story-teller, and a man of science. Those who applied early enough to obtain tickets were fortunate indeed, for the Fellow chosen to thank these guests for coming delighted his audience, while the evening's entertainment included also a series of living pictures drawn with sure touch by their President. Lord Dawson lifted the curtain, for a moment only, on the periods when the ways of removing or alleviating pain by anæsthesia and by good nursing were revealed, gave a glimpse of the great men, past and present, commemorated during this year, noted an important recent discovery, and gave generously of the philosophy which his vast experience of medical practice has taught him.

The toast of the Society was proposed by Mr. WINSTON CHURCHILL. It was a great honour, he said, to be the fellow-guest of Mr. Rudyard Kipling. He had always been one of Mr. Kipling's greatest admirers, but the admiration had not always been reciprocal. Mr. Churchill praised the Royal Society of Medicine as one which, founded in the year of Trafalgar, had worked for the cultivation of knowledge of all parts of medicine and of the branches of science allied to it. It was just because of the unceasing expansion in the sum of human knowledge, spreading in every direction, that societies like this had now acquired a vital and essential position in the intellectual and practical life of the community. There was an increasing need of combining and focusing all the results of human study in each particular branch. The army was moving forward; we had to be sure that the furthest point reached by the most adventurous patrol at dusk was entrenched and occupied before dawn. The institution of a collective mind to cope with the knowledge which had long in its volume surpassed the capacity even of the greatest individual men was the principal reason which he would advance in proposing the toast of the Royal Society of Medicine. In its empiricism, in its continual contact with the unknown, medicine resembled in many respects the political profession. Every human being, every living body, he said, is an empire, with a population of many different races living in vast provinces under different conditions of pressure and time, subjected to accidents and misfortunes, and usually in a state of internal or external war. As long as the presiding genius, the central governing control, is seated firmly on its throne, order reigns and harmony prevails throughout the whole combination of this complex organism. But when the central power begins to weaken, or is ageing, or is opposed or undermined by any cause, sudden or gradual, then disorder, discontent, riots, mutinies, revolts, and revolutions break out. Mr. Churchill continued: "Those in our politics see some of the diseases with which medicine grapples. Communism is a form of cancer; it is political cancer, the revolt of a single cell which subverts and throttles those immediately around it and establishes a foreign principle of life within the body politic, a principle of life governed by laws unknown to the rest of the empire, manifesting itself by most violent symptoms, and requiring remedies about which there are great differences of opinion. Some say the knife; all are agreed that the remedies should be prompt and drastic.... We all know the danger—I certainly do—of intervention in the affairs of a foreign country. How can anyone know all the forces that are at work, the mysterious reactions which may follow from the application of any remedy? One hopes for the best, but this intervention in the affairs of a foreign State is exactly what every doctor has to do every time he prescribes for any patient. The resources of intervention are growing, but the variety of conditions is intricate. The Royal Society of Medicine is a sort of League of Nations, applying to the disorders of the State the remedies which comprise the collective knowledge and the concerted effort of all that has been achieved by all the organisations of mankind which are directed to the purpose of human welfare."

Having spoken about the doctor's troubles in dealing with the human body and the politician's difficulties in guiding the affairs of citizens, Mr. Churchill said that they were all together that night dealing with difficulties of the government of man, and he wished to give a word of advice to their patients. He would like to say to them: "Do not be in too much of a hurry to change trusted and sober-minded advisers, or to run after the latest quack who comes up with some potent cure-all specific to wave away the ills that have racked mankind since the dawn of time. No, let us carry on this steady treatment." Here, he felt, there would be entire sympathy between the medical and political professions.

Lord DAWSON, in response, said that the Society continued to grow in wisdom, in stature, and comprehensiveness. They were proud of having been able to show the way to the world of commerce in the conception and achievement of a "merger," and without the allurements of material gain. He would not attempt to recapitulate the achievements of medicine in recent times. But he would note, as illustrations of the great part the English-speaking world had played in the development of medicine, that the arts of anæsthesia and nursing—both embodying the quality of mercy—were, both as regards their origins and highest expressions, products of the English-speaking world. Reviewing the events of the past year, Lord Dawson referred to the celebration of the tercentenary of the birth of Harvey—which brought men of learning from the world over to this country. The most notable event of the festival was the fact that, as if moved by a common sentiment, the distinguished men of all countries with one accord acclaimed Pavlov their hero. This Russian genius had in the heyday of his manhood laid the foundations of much of our knowledge of digestive processes and paved the way for the surgery of the gastro-intestinal tract. Then came the war and the revolution in his country, and he became lost from view, and at one time it was feared, from life. Yet Pavlov kept the lamp of knowledge burning and there reappeared amongst us this year this heroic figure—old now in body, ever young in spirit—who gave us some of the results of years of patient research on that new subject of conditioned reflexes which he had given to the world of thought. Lord Dawson spoke also of the growing control of tropical disease, making the Empire safe for civilisation. The Commission of Inquiry into Yellow Fever not only illustrated that theme but showed the world the spirit of medicine at its best, and the

names of Adrian Stokes, Noguchi, and William Young would always be remembered with pride. Passing from action to thought and its trend, he instanced the recent discovery that by irradiation ergosterol becomes endowed with the qualities of vitamin D. Here we had got away from the cruder conceptions of bulk and weight and were concerned with those subtler imponderable physico-chemical changes which connote the word influence. They had seen an example of irradiation to-night in the eloquence of the Chancellor, inspiring and delighting the assembly. Medicine, with the steady move of its thought towards the threshold of disease, would in the future have closer contact with man—his work and his play—and would be more concerned with his inborn qualities, physical and psychical, and his environment, and less with external attacks. They were passing, in fact, from the age of acute to subacute infections, where the host counted for more, and would think of forces rather than lesions—passing from the static to the dynamic. So it would be with the statesman; his policy would no longer be decided, still less excused, by wars and pestilence, and would have its origin in the study of the people, their qualities and needs.

Lieut.-Colonel W. P. MACARTHUR proposed the health of the guests. He spoke with eloquence of Mr. Churchill's versatility, and then of Mr. Kipling's services in the cause of Empire. Mr. Kipling's pen had raised the word "Britisher" from a contemptuous epithet to a fine title. He was accounted a poet peculiarly English, yet his love of this country was set so deep down in the soil that he was sometimes more Englander than English, and his fairy people had their beginnings so far back in the twilight of the island that even in the title "Puck of Pook's Hill" the two essential words were pre-Saxon, relics of a language long gone by. The other guests who graced these festivities had won fame in very varied fields. Col. MacArthur concluded by admitting to a spirit of envy of all those present who could sit in the glorious assurance that they would not be called on to speak.

Mr. Rudyard Kipling's response will be found on p. 1061.

Sir ERNEST RUTHERFORD, who also replied for the guests, spoke hopefully of the future of research in medical and allied sciences. More money and more support would surely be available for this purpose, since it was becoming increasingly recognised that work on the basic sciences was necessary if any serious understanding of the functions of the human body was to be obtained. He believed that in the future every country in the civilised world would coöperate in an international attack on the diseases afflicting mankind. They would look to the British Government to join with other progressive Governments and to see that the problems were attacked in a proper and adequate way.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—On Monday, Nov. 26th, at 5 P.M., at the Medical Society of London, 11, Chandos-street, Cavendish-square, W., Dr. Donald Paterson will lecture on Some Problems in Infant Feeding; on Wednesday, the 28th, at 11 A.M., at the same place, Mr. Victor Bonney will give a "gynæcological talk"; and on Thursday, the 29th, at 4 P.M., Mr. J. F. Cunningham will give a demonstration at the Central London Ophthalmic Hospital. At 2.30 P.M. on Monday, the 26th, Dr. A. J. Whiting will demonstrate at the Prince of Wales's General Hospital, Tottenham. No fee will be charged for admission to the lectures or demonstration. Special courses are now being held in urology at St. Peter's Hospital, ophthalmology at the Royal Westminster Ophthalmic Hospital, neurology at the West End Hospital for Nervous Diseases (daily at 5 P.M.), and venereal diseases at the London Lock Hospital. During December there will be two courses only—in infants' diseases at the Infants Hospital (Dec. 3rd to 15th), and in dermatology at the Blackfriars Skin Hospital. Copies of all syllabuses and information about the General Course arranged by the Fellowship may be had on application to the Secretary at 1, Wimpole-street, W. 1. The complete list of special courses for 1929 is now ready.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1927 statistics of five administrative counties:—

Name of county and estimated (R.-G.) population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and pre-school mortality.	Diarrhœa, &c., under 2 years.	Maternal mortality from childbirth.
Lancashire (1,800,300)	14·6	12·7	0·78	1·34	2·7	1·9	73/37	6·6	4·9
Essex (1,024,700)	16·2	10·8	0·80	1·41	2·0	1·7	51/24	4·2	3·4
Durham (996,600)	20·3	12·5	1·10	0·98	2·9	1·2	96/55	7·0	5·6
Derbyshire (621,000)	18·0	11·6	0·71	1·24	2·6	1·5	71/—	5·3	5·0
Hampshire (416,000)	16·9	11·9	0·78	1·59	2·0	2·1	48/27	2·1	2·7

Neonatal mortality is not given in this series of reports.

Lancashire.

Dr. J. J. Butterworth expresses some dissatisfaction with the slow progress made in the pooling of isolation hospital accommodation in the administrative county, which comprises 19 municipal boroughs, 82 urban districts, and 19 rural districts—120 in all. Some of the hospitals are efficient, many are unsatisfactory, and in many the existing accommodation is not fully utilised.

For the purpose of the Milk Act the council employs 30 part-time veterinary surgeons, resident in all parts of the country, who also perform the duties under the Diseases of Animals Acts. In 12 boroughs and seven other districts the services of veterinary surgeons are available for the inspection of dairy cows, but the county council confines itself to following up tuberculous milk samples. 372 such notifications were received from local authorities, and as a result 2056 cows were examined, but the number of tuberculous animals found is not mentioned. No. 4 Clean Milk Competition was held over a period of six months, but attracted only 15 competitors. The housing conditions in 11 of the districts are described as unsatisfactory or not good; in 84 districts a shortage is reported, and in 14 there was considerable or serious overcrowding. The houses erected by local authorities numbered 4363 and other houses erected with State assistance numbered 4898. The county council has an approved scheme under the Housing (Rural Workers) Act, 1926. Up to July, 1928, 18 applications for financial assistance were received, and grants amounting to £580 were recommended in respect of five. Of the other applications 12 came to nothing and one is under consideration.

An unusual outbreak of diphtheria was reported in a Heywood family. One child at the school clinic was found to have ordinary diphtheria, and of two children at home one had both eyes affected and the other, which was the original case, a diphtheritic discharge from the ear. There were 190 notifications of small-pox and one death was registered, in the person of a tramp, who died in the union workhouse unnotified. In Dalton-in-Furness, Padiham, and Whiston, where diphtheria of a virulent type was prevalent, immunisation was found useful. The notifications of enteric fever were 123 with 26 deaths. An outbreak in an institution for boys at Widnes caused 32 cases and the only article of food on which suspicion rested was

foreign currants eaten raw. The peak year for encephalitis was 1924, when there were 299 cases and 103 deaths. During the last three years the notifications have been 178, 159, and 107, and the deaths 98, 88, and 89. The midwives sent for medical help in 37 per cent. of their cases, and the total payments to doctors amounted to £12,154, of which, according to the scale adopted, £10,370 have to be borne by the county council. No recovery is attempted when the doctor is called in on account of the babies' eyes, and £94 was paid in respect of 87 such cases. There were 208 notifications of ophthalmia neonatorum and among the survivors there was one case of total blindness and two of impaired vision.

There were two prosecutions of handywomen, but both were dismissed by the bench. In the one case the witnesses did not adhere to their proofs of evidence and in the other case the handywoman, who was engaged, was sent for at 8.30 P.M., "as labour was imminent." The doctor engaged was not sent for until after 10.15, and when he arrived everything was over. The bench considered that the defendant had acted in the best interests of her client.

Essex.

Dr. William A. Bullough expresses his satisfaction that the Ministry of Health have agreed to the long-deferred scheme of building a central institution with 150 beds for women and children suffering from tuberculosis at Black Notley, near Braintree. The Ministry of Health have now given instructions that cases of tuberculosis cannot be regarded as cured until the disease has been quiescent for two years and arrested for three years in pulmonary cases and arrested for three years in non-pulmonary cases. This, of course, upsets the comparison with past years. A determined effort is now being made in Essex to keep in touch with the contacts of open cases of tuberculosis. A pink card is issued for each of such and passed on by the infant welfare officer to the school medical officer, and ultimately sent back to the tuberculosis dispensary, with a view to re-examination from time to time. The need for X ray plant at the sanatorium in order to facilitate treatment by artificial pneumothorax has been made good. An attempt is to be made to secure a more rapid diagnosis in the case of children suspected to be suffering from pulmonary tuberculosis by their admission to the Victoria Park Hospital, for the application of all the most modern methods. It is hoped that in a few years every parish in the county will be served by a trained midwife. Though in a few districts maternity hospitals may be useful, the main effort should be, says Dr. Bullough, to ensure a safe confinement in the home. More effort is needed to secure the treatment of the defects found in school entrants during the pre-school age.

Dr. Bullough comments adversely on the scattered house-building which is going on in several of the rural districts. He is also not too favourably impressed with the L.C.C. Becontree scheme. Under this scheme since the war 17,000 houses have been built or are in course of erection in what was up to April, 1926, a parish in the rural district of Romford. The population will soon be 85,000 and ultimately 130,000, and though excellent sites were reserved for industry no industry has been begun. Dagenham is therefore a dormitory town of low rateable value for London workers. "This type of town planning," says Dr. Bullough, "has very little to commend itself." An effort is being made to get the railway companies to improve the travelling facilities between East London and Becontree. The county council have an approved scheme for the Housing (Rural Workers) Act, 1926, and of 20 applications for assistance, seven respecting 14 cottages, received total grants of £895. Two applications were not approved and 11 were under consideration at the end of the year. Complaints were received during 1927, as in many previous years, of offensive smells in the Purfleet neighbourhood, blown across the river from the sludge lagoons of the West Kent main sewage works. The dumping of London refuse on the north of the Thames at Hornchurch has also given rise to many complaints. The refuse dumps are in the neighbourhood of the L.C.C. Becontree housing estate. The Ministry have been asked to hold an inquiry.

Durham.

Dr. Eustace Hill reports that the death-rate and infant mortality-rate were higher owing to bad climatic conditions in the first and last quarters and an unusual prevalence of influenza and respiratory diseases. The deaths ascribed to influenza numbered 496 as compared with 250 in the previous year. There were 5101 notifications of small-pox and 19 deaths were attributed to this disease, though the majority were complicated with other acute conditions. The Ministry issued regulations in January giving the county council special powers to provide hospital treatment, and these powers facilitated arrangements for pooling the available small-pox accommodation. Several patients were admitted to the Princess Mary Maternity Hospital, Newcastle, under the Puerperal Fever Regulations, but no request was received for a "second opinion," nursing assistance, or bacteriological examinations. There were 33 notifications of encephalitis and 37 deaths bearing out the truth of a previous statement by Dr. Hill that many cases of this disease are not notified.

The welfare medical officers report that the mothers do not bring the pre-school children to the centres in adequate numbers. A special dental campaign has been carried out through the centres by means of lectures, reinforced by slides, posters, and leaflets supplied by the U.K. Dental Board. The E. F. Peile Convalescent Home at Shotley Bridge has done good work for nursing mothers and their babies and pre-school children. After leaving the mothers are recommended to bring their children to the centres, but 27 per cent. failed to do so. Owing to unemployment much dried milk was supplied free at a cost of nearly £30,000. After the emergency feeding scheme ceased each applicant had to pay at least 1*d.* a lb. At the end of the year 5703 cases were being helped. There were 148 cases of ophthalmia neonatorum notified, and the health visitors reported 824 cases of inflammation of the eyes. The damage included one blinded baby, four with both, and one with one eye injured. There are now 74 nursing associations affiliated to the County Association. Hitherto the expensive method of sending patients to Newcastle for light treatment has been in operation, and it is now proposed to fit up the county sanatoriums with the necessary apparatus.

The housing problem remains acute; 200,000 people live in one- and two-roomed houses, the percentages of overcrowding among them being 76 and 56 respectively. Up to now the county veterinary inspector has only followed up information received as to tuberculous milks, but by this method 3286 cows were examined. The animals slaughtered for tuberculosis numbered 221, of which 69 had tubercle of the udder, 47 emaciation, and 99 other signs. The county council has now decided to appoint whole-time veterinary surgeons to carry out the various Milk Acts and Orders. The Sale of Foods and Drugs inspectors sent 40 samples of milk to be examined for tubercle, and six were found to be infected.

Derbyshire.

Dr. W. M. Ash describes the rapid progress recently made in the development of Bretby Hall Orthopædic Hospital. It was opened in 1926 and now is fully equipped for the treatment of 55 tuberculous and eight non-tuberculous cripples. The equipment includes an operating theatre and an X ray and light department. A fully qualified teacher and an assistant teacher have been appointed and Dr. S. Hoyte, F.R.C.S., is the orthopædic officer in residence. The building of a modern open-air block (a plan of which is given), with two 20-bed wards and one 10-bed ward, has been begun, to accommodate 50 non-tuberculous cripples, while plans for another open-air block to accommodate 32 adults suffering from non-pulmonary tuberculosis

has been approved. Chains of orthopædic clinics for out-patient treatment are to be established throughout the county, whilst the sparsely populated portions of the county will be provided for by a motor-car service. The greatest importance is attached to the education of the children admitted as many of them have hitherto received very little education and, being cripples, they will largely have to depend for a living on their brains. Dr. Hoyte reports, for example, that the present patients include three boys aged 11, 13, and 16, who had never been to school and did not know the letters of the alphabet. Small classes and an unusually large staff of teachers will be necessary.

The midwifery service is being improved. Midwives' clubs are being formed, where the midwives can be instructed in modern methods. A successful one is already in operation at Chesterfield and five other centres have been arranged for where lectures and demonstrations can be given. A full-time woman medical officer, with extensive experience in gynæcology and obstetrics, has been appointed to conduct antenatal clinics at about 12 centres, to instruct and inspect the midwives, to investigate maternal deaths, and to supervise the council's maternity homes. Under the puerperal fever regulations nine cases were admitted to hospital, and a consultant's opinion was provided in six cases. There are five consultants in all—two in Derby, two in Sheffield, and one in Manchester. Derbyshire is well supplied with hospital accommodation, and Dr. Ash is of opinion that it is better to provide lying-in accommodation by small extensions of existing hospitals than to provide new small expensive units.

Hampshire.

Dr. R. A. Lyster reports that the county council is now the authority for the Notification of Births Act, except for the city of Winchester and the borough of Aldershot, and that notification is well carried out, the default being less than 1 per cent. The eight subsidised beds at the Winchester Maternity Society's home were used by 137 cases. The Royal Hants Hospital has an antenatal clinic twice a month, in order to sort out abnormal cases for admission to the hospital from those cases suitable for the home. All the maternity and child welfare centres are voluntary. They now number 89 and only cost the county council £600 a year. There is a growing demand for antenatal clinics and five have been established in connexion with maternity and child welfare centres. Another chief clinic, similar to that at the Hants Hospital, has been established at Basingstoke, under the charge of an obstetrician. For the purpose of the puerperal fever regulations 12 consultants have been appointed after conference with the B.M.A. division and the Panel Committee.

The working of the insurance scheme against the expense of medical help summoned by the midwives shows that under this system the doctor is much more frequently called in. Thus, during 1927 the midwives attended 5554 cases, of whom 2718 had insured and 2836 had not insured. Among the insured cases a doctor was called to 45 per cent.; among the uninsured to 25 per cent. The insured cases cost the county council £897, or 6*s.* 7*d.* each; whereas the uninsured cases cost the county £436, or 3*s.* 1*d.* each.

Most of the inspection of midwives is carried out by the superintendent of the County Nursing Association. Dr. Lyster points out that at the conferences between local authorities and the Central Midwives Board it was unanimously agreed that the post of superintendent of the County Nursing Association should be separated from that of inspector of midwives. Dr. Lyster reiterates his opinion that venereal diseases can be effectively prevented and that the facts are kept from the public by a conspiracy of silence. All but eight of the 39 districts have instructed their officers to send samples of milk to the county laboratory for tubercle examination. Positive results will be followed by veterinary examination of the herd. A table shows that 364 samples of milk were examined with five positive results. It is not mentioned whether the examinations were microscopical or biological, and the results in the finding of tuberculous cows are not given.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED NOV. 10TH, 1928.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 149 (last week 122); scarlet fever, 2958; diphtheria, 1320; enteric fever, 33; pneumonia, 890; puerperal fever, 37; puerperal pyrexia, 82; cerebro-spinal fever, 8; acute poliomyelitis, 11; acute polioencephalitis, 1; encephalitis lethargica, 16; dysentery, 11; ophthalmia neonatorum, 94. No case of cholera, plague, or typhus fever was notified during the week.

The cases of small-pox were notified in the following 20 counties: London, 4; Chester, 5; Derby, 21; Devon, 6 (*Plymouth*); Durham, 26 (of these Jarrow 16); Essex, 6 (West Ham); Huntingdon, 1; Lancaster, 7; Leicester 6 (county borough 5); Lincoln, 1; Northumberland, 1; Nottingham, 3; Stafford, 13; Warwick, 8 (Coventry); Wilts, 2; Worcester, 1; Yorks, East Riding 1, West Riding 17; Glamorgan, 13; Monmouth, 7.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Nov. 13th–14th was as follows: Small-pox, under treatment 16, under observation 2; scarlet fever, 2743; diphtheria, 1963; enteric fever, 22; measles, 71; whooping-cough, 293; puerperal fever, 14 (plus 7 babies), encephalitis lethargica, 71; poliomyelitis, 2; "other diseases," 19. At St. Margaret's Hospital there were 15 babies (plus 4 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 2 (1) from enteric fever, 15 (2) from measles, 6 (2) from scarlet fever, 24 (5) from whooping-cough, 28 (9) from diphtheria, 78 (16) from diarrhœa and enteritis under two years, and 68 (18) from influenza. The figures in parentheses are those for London itself.

The fatal case of enteric fever outside London occurred at Bolton. Liverpool reported 3 fatal cases of measles, Walsall, Hull, and Newcastle-on-Tyne 2 each. Sunderland and South Shields each reported 2 deaths from whooping-cough. Oldham 3 from diphtheria. Deaths from diarrhœa are still high; Liverpool reports 12, Manchester 10, Stoke-on-Trent and Salford 4 each; while Glasgow, Dublin, and Belfast record 4, 4, and 6 deaths respectively for the same week. The number of stillbirths registered during the week in the great towns was 227 (corresponding to a rate of 41 per 1000 births), including 45 in London.

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the committee 42 applications for grants were considered and £704 4*s.* was voted to 38 applicants. The following were some of the cases relieved:—

Widow, aged 62, of M.B. Since the death of her husband in 1913 the applicant has been entirely supported by her elder daughter who was doing well on the stage. This daughter died early in September, 1928, after a short illness, leaving her mother destitute and without means of support. Voted emergency grant of £10 and a yearly grant of £36 in four instalments. Other medical charities have been approached to augment the widow's income.

Widow, aged 65, of M.R.C.S. Was left penniless on the death of her husband in 1920. She has lived with her elder daughter who is a widow with one child aged 12. The daughter is earning £2 10*s.* a week which is the only income for these three persons. Voted £36 in four instalments.

Widow, aged 65, of L.R.C.S. For eight years after the death of her husband the applicant supported herself by letting rooms. Later she earned her living as a cook-housekeeper, but owing to her age had to give up work. She lives with her adopted daughter who receives £4 a month from her husband who is working in Canada. Voted £36 in four instalments.

Daughter, aged 52, of L.R.C.P. She is living with her brother who is only able to earn £71 10*s.* and lives rent free in three rooms. On many occasions it has been found that the applicant was practically starving. Voted £26 in four instalments and clothes to be supplied by the Guild. The local Council of Social Welfare is interested in this case.

Subscribers and donors are asked to forward their subscriptions for the current year before Dec. 31st, 1928. Not only the scope of the Fund's work, but also the amount of assistance given depends upon the subscriptions received, and in view of the many cases in which help is greatly needed, especially during the winter months, an urgent appeal is made for contributions. Cheques should be sent to the hon. treasurer, 11, Chandos-street, Cavendish-square, London, W. 1.

Correspondence.

"Audi alteram partem."

THE DERATING OF HOSPITALS.

To the Editor of THE LANCET.

SIR,—I would suggest that the governing bodies of hospitals should consider seriously the expediency of appealing for hospitals to be brought within the derating provisions of the new Local Government Bill. Their need is great, the justice of such a course is evident, and I do not propose to take up your space by adducing arguments. It is essential to act without delay. I am, Sir, yours faithfully,

Buxton, Nov. 17th, 1928. CHARLES W. BUCKLEY.

THE HÆMOGRAM.

To the Editor of THE LANCET.

SIR,—The papers on the blood and Arneth counts you have been recently publishing and an excellent paper in the *Journal* of the Royal Naval Medical Service for October, by Surgeon-Commander W. I. Gerrard, who (quoting Piney) refers to Schilling, encourage me to say a word on Schilling's hæmogram. Both this and his work on the blood picture are too little, I venture to think, known in England. An assistant in Berlin University, he contributed the section on Blood Examination to the great Tropical Diseases Handbook, has written a book on "The Blood Picture" (now in its sixth edition) and two students' guides, one on general blood study, the other on the deep drop (each in its third edition)—evidence that his work is appreciated in Germany.

Schilling takes the view that the normal blood picture is a cell complex of highly differentiated cells, ripened though not of equal age, in very constant proportion, altered at one end by degeneration or loss (i.e., hæmorrhage), at the other by regeneration, the work of the blood-forming organs, bone-marrow (red cells and granulocytes), lymphoid tissue (lymphocytes), and the reticulo-endothelial tissue especially of the spleen and liver (monocytes). Disease alters these organs and the variation in their output shows in the blood. There is normally a definite point in development at which these cells are drafted into the circulation. When irritation occurs, replacement is needed, and as this need increases, the barriers to the circulation are lowered further and further and cells are sent out less and less mature. This immaturity is shown by the Arneth count, but red cells, eosinophiles, &c., must also be considered, and to make this easy, to ensure that none is overlooked, is the purpose of the hæmogram.[1] This, when completed, shows red and white count, hæmoglobin, deep drop, parasites, and so on; the white cells are charted in great detail, basophiles, eosinophiles, neutrophiles, four groups—(*a*) myelocytes; (*b*) metamyelocytes with round nuclei ("immature"); (*c*) metamyelocytes with notched nuclei ("band-form"; I submit "ribbon-like" is more what is meant, like a capital U, the nucleus the same thickness all along; (*d*) multilobed polymorphs. The names "immature," "band," and "multilobed" are from Admiral Stitt's book in which they first, so far as I know, got English names. Ordinarily there are 4 of (*c*) to 63 of (*d*). As the need for replacement increases and the reserves are hurried up, more and more (*c*) appear; perhaps (*b*), even (*a*). This is "the shift to the left," measured by the fraction $\frac{a+b+c}{d}$; in a blackwater case it may be $\frac{21+21+16}{28}$ or 2. Other showings must be taken into account. Of three cases of acute pyrexia with leftward shift and leucopenia one might be a malarial relapse, shown by polychromasia of the red cells, one sand-fly fever, with a very characteristic leftward shift; dengue shows less leucopenia, less leftward shift, no polychromasia. The hæmogram also gives warning of such complications as sepsis, hæmorrhage; the blood reacts more quickly than the temperature. Like the findings of auscultation, those of the hæmogram are not always easily interpreted, but experience will help. As Schilling says, it is not the blood which deceives. He wishes the clinician to tell the pathologist his (clinical) diagnosis of the case, when the clinician will be informed whether that seems probable, possible, or unlikely to the pathologist, for thus it is easy to have an objective check on diagnosis. Unexpected conditions may come to notice, of which he gives examples.

I regret I can myself say no more, as Schilling's book came my way only after I had ceased to work in laboratories. But I submit his method is very valuable.

I am, Sir, yours faithfully,

Kew, Nov. 18th, 1928. W. E. HOME.

[1] Obtainable in pads from Lautenschläger, Berlin, N.39.

SALVARSAN TREATMENT OF ANTHRAX.

To the Editor of THE LANCET.

SIR,—In discussing the chemical treatment of anthrax in your Modern Technique series Dr. Adrianus Pijper, after pointing out the importance of neosalvarsan in anthrax, writes: "The salvarsan treatment of anthrax has never failed us yet, although its theoretical foundation may be lacking." In my opinion the explanation is this. Neosalvarsan is a chemotherapeutic substance. According to Ehrlich these substances possess haptophoric and toxophoric groups. After absorption by the blood cells haptophoric groups of neosalvarsan combine with the chemo-receptor groups of the micro-organisms, while the toxophoric groups exercise baneful influence over the bacteria. The factor of stimulation may come in, as well as that of immunity. Arsenic compounds, like those of antimony, belong to a group which wields wide influence on various infections of different ætiology, while the amount of active immunity is, as we know, more marked during the beginning of infection. I think the action is bacteriotoxic rather than bactericidal.—I am, Sir, yours faithfully,

P. V. KARAMCHANDANI, M.B., I.M.S.,
In charge, Indian Military Hospital, Pishin (Baluchistan), India.

Oct. 23rd, 1928.

"FEE-SPLITTING."

To the Editor of THE LANCET.

SIR,—According to the legal reports in the *Times* of Oct. 25th a lady who is principal of the Radiant Health Institute said in evidence that she was sent cases by many leading specialists, and that these gentlemen shared her fees. This statement might very well be ignored but for the unfortunate fact that three of the foremost and most respected names of the profession appear in the report in very close juxtaposition to this allegation. Probably these gentlemen felt the matter to be beneath their notice, but would it not be very desirable that they should publish a short disclaimer or require the lady in the case to make it quite clear that she was not referring to them?

I am, Sir, yours faithfully,

DONALD M. O'CONNOR.

Malmesbury, Wilts, Nov. 7th, 1928.

*** There are charges too wild to need refutation. Dr. O'Connor has perhaps taken the case of McCalman *v.* Walton (*Times*, Oct. 25th) too seriously. Plaintiff complained that defendant's "Radiant Health Institute" had failed to give her a continuous course of "curative rhythm" because defendant was preoccupied with a project for rejuvenating elderly ladies at £500 apiece. Defendant admitted she had had this golden vision; a medical practitioner was to help her and three distinguished specialists (whom she named) would send patients and share fees; but she added regretfully that the project never got beyond the visionary stage.—ED. L.

SHAKESPEARE'S DOCTORS.

To the Editor of THE LANCET.

SIR,—It would be interesting to know upon what grounds Sir StClair Thomson (as reported in your issue of Nov. 10th, p. 977) thinks that Shakespeare had "rather made fun of doctors up to King Lear." As a matter of fact, Shakespeare shows far more consideration for the medical profession than does any of his contemporary dramatists. Possibly Sir StClair Thomson had in memory the Pinch of the "Comedy of Errors" and Dr. Caius of the "Merry Wives," but when it is borne in mind that in both these plays Shakespeare was merely working upon older material (as is so ably shown by the Rt. Hon. J. M. Robertson in his "Canon of Shakespeare," Part II., and his "Problem of the Merry Wives of Windsor") in which he probably had no alternative but to retain certain comic parts dear to the groundlings, he can hardly be made responsible for the anachronism Pinch or the caricatured Frenchman. Shakespeare's own doctors are Dr. Butts (introduced for a brief moment into the last act of "Henry VIII." in a strictly non-professional character), who does not count, since he is probably introduced by Fletcher, Dr. Cornelius of "Cymbeline," and the deceased Gerard de Narbon in "All's Well," all worthy men and not "made fun of." Further, there are the unnamed doctors in "Macbeth" and "Lear," also worthy and serious delineations. As to references to the profession, it is true that in "Much Ado" (v., scene i.) there occurs: "Then is an ape a doctor to such," but here, as in many other passages (the word "doctor" occurs 64 times in Shakespeare, but in the medical sense in 46 only), it means a "learned man." Nor in the 29 passages containing the word "physician" can I find one in which the title or the calling is ridiculed.

It is very different when one comes to consider the other Tudor dramatists. I have a list of 29 named and unnamed doctors culled from the works of Ford, Jonson, Webster, Tourneur, Massinger, Greene, Fletcher, Beaumont, Marlowe, Middleton, Dekker, and Chapman, excluding surgeons. Of these, some are good fellows and good doctors; others, like Eudemus, in "Sejanus," and Lecure, in "Thierry and Theodoret," are scoundrels, panders, and poisoners; Alibius, in "The Changeling," keeps a very doubtful private asylum, and the unnamed physician in "The Fair Quarrel" is one of the lowest blackguards to be found in any play. In no work of Shakespeare can be found such a passage as the remark of the "Spanish Curate":

> "The doctors are our friends; let's please them well;
> For, though they kill but slow, they are certain."

or that in "The Lover's Melancholy":

> "Thou art in thy religion an atheist, in thy condition a cur, in thy diet an epicure, in thy lust a goat, in thy sleep a hog; thou takest upon thee the habit of a grave physician, but thou art indeed an impostorous empiric. Physicians are the cobblers, rather the botchers, of men's bodies; as the one patches our tattered clothes, so the other solders our diseased flesh."

A knowledge of the works of his contemporaries adds greatly to one's appreciation of Shakespeare. There is no physician among their characters that can compete in delineation with, say, the unnamed man who ministers to Lear, or the wise Cornelius who circumvents Cymbeline's vile queen, or the Scottish doctor who has to face Macbeth. They are as different as is Shakespeare's soaring, Pegasus-like verse from the pedestrian lines of his brother playwrights, even from "Marlowe's mighty line." To paraphrase a modern poet: "What do ye know of Shakespeare Who only Shakespeare know?"

I am, Sir, yours faithfully,

Wimpole-street, W., Nov. 10th. MACLEOD YEARSLEY.

ST. MARY'S HOSPITAL, PLAISTOW.—The Lord Mayor of London has opened the first section of the new out-patients' department which has cost £16,000. The section includes an accident receiving room, casualty, general and ophthalmic operating theatres and the necessary concomitants, and accommodation for five extra accident cases.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

LOCAL GOVERNMENT (SCOTLAND) BILL.

THE Local Government (Scotland) Bill, which has been introduced in the House of Commons by Sir JOHN GILMOUR (Secretary of State for Scotland), is divided into four parts. Under Part 1 the county councils (as reconstituted) and the town councils of burghs having a population of more than 20,000 will become the authorities for poor-law, lunacy, and mental deficiency, major health services, classified roads, and certain other services. Among the bodies that will disappear after the passing of the Bill are parish councils (the existing poor-law authorities) and district boards of control (who are at present charged with the administration of the Lunacy and Mental Deficiency Acts). Where a district board have provided a district asylum the county councils and the town councils of the large burghs within the district are treated as having combined for carrying on the asylum. With certain unimportant exceptions the expenses relating to the transferred functions will be charged over the whole area of the county or large burgh, and not on the basis of the parish or district as hitherto. Among the principal matters with which the enactments set out in Part 1 of the First Schedule deal are: Infectious diseases (including tuberculosis and venereal disease), maternity service and child welfare, milk and dairies, adulteration of food and drugs and unsound food, and town-planning. The first four categories may be described as the major health services. Clause 11 contains further provisions with regard to combinations of local authorities. Such combinations may be voluntary, but where combination would be of public or local advantage it may also take place as a result of an Order by a Central Department, such as the Secretary of State, the Scottish Board of Health, and the General Board of Control for Scotland. Compulsory combination of authorities can take place only on the application of one of the authorities. In counties there must be a committee for poor relief, and a provision is inserted permitting any council to include in any committee or subcommittee persons who are not members of the council so long as at least one-half of the members are members of the council. No council is allowed to delegate to a committee any function relating to raising money by rate or loan or incurring capital expenditure. Clause 13 permits a county council to delegate certain functions to the town council of a small burgh on terms to be agreed upon. Under Clause 18 the limit of 1s. per £, which still applies in counties to the public health general assessment, is repealed. Clause 19 makes it compulsory on every rating authority instead of levying separate rates for poor relief, public health, and so forth over the whole area of the authority to levy a consolidated rate. Clause 24 empowers a county council to give financial assistance to any special district (e.g., for water or drainage) where the district in their opinion is unable to bear the whole expense unaided. Clause 25 provides that if the town council of a small burgh fail to discharge their duties with regard to water-supply, drainage, or housing (which duties are not being transferred by the Bill to county councils), or any other public health duties, the Scottish Board of Health may empower the county council to discharge the duty at the expense of the burgh for such period as may be specified. Clause 26 provides that when a vacancy occurs in the post of medical officer of health or sanitary inspector of a small burgh the county medical officer of health or sanitary inspector shall be appointed to the appropriate vacancy unless the Scottish Board of Health otherwise agree.

NEW BILLS.

In the House of Lords on Wednesday, Nov. 14th, Lord DARLING presented a Bill for the preservation of infant life. In the House of Commons on the same day Sir R. GOWER presented a Bill to prohibit the vivisection of dogs. Both measures were read a first time.

EXPIRING LAWS CONTINUANCE BILL: THE TWO-SHIFT SYSTEM AND WORKERS' HEALTH.

On Friday, Nov. 16th, the House of Commons went into Committee on the Expiring Laws Continuance Bill, Mr. HOPE (Chairman of Committees) in the Chair.

Mr. RHYS DAVIES moved an amendment to omit the continuation of Section 2 of the Employment of Women, Young Persons and Children Act, 1920. About 800 orders, he said, had been issued under this clause, and they would soon reach the stage when all the workpeople in the country would be employed under the two-shift system, which would be a terrible state of things indeed. The proof that the system was never intended to continue beyond the war period was to be found in the section itself which provided

that it should be abolished on Jan. 1st, 1926. The continuance of this section was, in fact, torpedoing the Factory Act of 1901 by destroying one of its main provisions.

Miss BONDFIELD said that she had received some very pathetic letters addressed to her, not as a Member of Parliament, but as the chief woman officer of her own trade-union. She had a number of letters from mothers in which they made reference to the injury done to the health of their daughters. It seemed to her that it was the policy of the Home Office deliberately to encourage the establishment of the two-shift system. She supported wholeheartedly the demand for the withdrawal of the section.

After further debate,

Sir W. JOYNSON-HICKS (Home Secretary) said that the clause did not involve women and young persons working more than eight hours a day. It meant running a factory for 16 hours in two shifts of eight hours each, and there was a large amount of evidence in the possession of the Home Office that at periods of pressure it was better for the health of the workers to work under those conditions than to work overtime. An order was granted only after a very full and special inquiry had been made by the factory inspector as to whether the workers desired it, and consideration of whatever recommendations the inspector made in his report to the Home Office. Speaking generally, the standard of welfare in factories where the two-shift system was in operation was distinctly above the average of factories generally. After the Order was made the factory had to be visited at least once every quarter by the factory inspector. The number of Orders granted was 786 in respect of 681 works, but, so far as he could gather, not more than one-third of the total were at work at any one time. No hon. Member had put before him any evidence that the health of the workers suffered by reason of the two-shift system. He found that workers often applied to be put on the system, and that except in certain specified cases the women had not complained of the work, and were more than satisfied to go on with the system. The Medical Research Council and the Industrial Fatigue Board had made a very careful investigation into the consequences and effect of the two-shift system. They stated in their report that no conclusive evidence had been found of a greater amount of sickness on one side or the other. In three out of four typical factories investigated the Board reported that the workers preferred the shift work to the day work. He thought that it was an experiment well worth proceeding with.

The amendment was negatived by 122 votes to 106—Government majority 16.

CLOSING OF HAIRDRESSERS' SHOPS ON SUNDAYS.

On Tuesday, Nov. 20th, Mr. JAMES STEWART asked leave to introduce a Bill to provide for the compulsory closing of hairdressers' and barbers' shops on Sundays. He explained that the Bill, which he has introduced on several previous occasions, dealt with what was a dangerous trade. The conditions under which the people in the barbers' shop worked were injurious to their health. In a great many instances, the shops were unhealthy places, and if there was a proper standard of inspection many of them would not be allowed to carry on. The workers in this trade worked longer hours than did the average shopkeeper, the average being from 60 to 70 per week. In 1914, one out of every five of the persons engaged in the trade died of consumption, and to-day, if Members went to a barber's shop, they must remember that one out of five of the men who looked after them were sources of infection.

Leave was granted to bring in the Bill, which was read a first time.

HOUSE OF COMMONS.

WEDNESDAY, NOV. 14TH.

Scottish Local Authorities and Rating Reform.

Mr. SHINWELL asked the Secretary of State for Scotland how many local authorities had made representations to him expressing opposition to the proposed changes in local government in Scotland, and how many had stated their views in support.—Sir J. GILMOUR replied: I have received representations from 44 local authorities against, and from 20 local authorities in favour of, the Government scheme as a whole. In some cases representations in favour are conditional on amendments, more or less extensive, being made in the scheme, or on the new grants being adequate. I have also received a number of representations from local authorities as to details of the scheme.

Direct Sunlight in School Buildings.

Sir CHARLES TREVELYAN asked the President of the Board of Education why the Board had recently insisted on certain local education authorities, against their wishes, putting windows into their schools admitting direct sunlight; and whether, in view of the difference of expert opinion in the matter, he would allow local authorities discretion to experiment in this relatively small problem of school planning.—Lord E. PERCY replied: The authorities in question proposed to erect premises into which direct sunlight could never penetrate. Since, by the use of a blind, it will still be possible to exclude direct sunlight when desired, I do not think that there has been any unreasonable interference with the authorities' discretion. Experiment is good, and, as the right hon. Member must be aware, the rigidity of the Boards' building regulations has been very greatly relaxed during the last three years; but the essence of an experiment is that it may fail, and the experimenter should be careful to leave a way open for retracing his steps.

Salaries of Post Office Medical Officers.

Dr. LITTLE asked the Postmaster-General if he was aware that salaries paid to officers in the post-office medical service were lower than in any other Government department, and that it was the only department in which unequal rates of payment as between men and women obtain, and if he proposed to take suitable action in the matter.—Viscount WOLMER (Assistant Postmaster-General) replied: The salaries of the officers in question were recently the subject of a claim before the Industrial Court, who have referred the matter back to the parties for reconsideration. Pending further developments, I cannot make any statement on the matter.

THURSDAY, NOV. 15TH.

Assessment of War Pensions for Deafness.

Mr. R. MORRISON asked the Minister of Pensions whether there was any fixed rate of disability for an officer or man who was rendered stone deaf by head wounds; and whether, in fixing his rate of disability, any consideration was given to his pre-war occupation.—Major TRYON replied: The rate for total deafness caused by war service is fixed at 70 per cent. by the Royal Warrant. In the case of deafness, as of other disabilities, assessment is, in the interests of pensioners, uniformly in accordance with the degree of physical disablement, without regard to the fitness or unfitness of the pensioner for any particular occupation.

Milk Adulteration in Brecon.

Dr. VERNON DAVIES asked the Minister of Health if he was aware that in 1924 the county of Brecon, under the Sale of Food and Drugs Acts, examined only four samples of milk, of which three were found to be adulterated, and in 1925 they examined eight samples, all of which were found to be adulterated, and that in the years 1926 and 1927 no samples of milk were examined, in spite of the evidence of the unsatisfactory results of the previous two years; and what steps had been taken to draw the attention of the county authorities to these facts, and what reply, if any, had been made to such representation.—Mr. CHAMBERLAIN replied: So far as regards samples submitted to the public analyst the facts are as stated in the question. It is the practice in this county to have most of the milk samples tested informally by the inspectors, and only to send samples to the public analyst where the results of the informal tests show reason to suspect adulteration. During the four years in question over 1100 samples were tested by the inspectors in the county of Brecon. I have impressed on the county council the importance of submitting an adequate number of unsuspected samples to the public analyst, and they have promised that in future a certain number of samples will be regularly submitted to him.

Block Grants for Maternity and Child Welfare.

Mr. W. THORNE asked the Minister of Health if he was aware that the Association of Infant Welfare and Maternity Centres, representing 1200 local centres, had passed a resolution protesting against the proposals for reform in local government with respect to the substitution of block grants in support of maternity and child welfare service; and whether the views of this Association would be taken into consideration before the matter was brought before the House.—Mr. CHAMBERLAIN replied: The answer to the first part of the question is in the affirmative. The proposals of the Government in this matter are already before the House, and should, I think, completely dispel any fears lest the maternity and child welfare service should suffer by the changes foreshadowed.

Reconstituted Cream Bill.

Mr. EVERARD asked the Minister of Health whether he proposed to introduce the Reconstituted Cream Bill during the present session.—Mr. CHAMBERLAIN replied: I regret that it will be impossible to find time for such a Bill this session.

Maternity and Child Welfare.

Mr WEBB asked the Minister of Health the total number of local health authorities which might take action under

the Maternity and Child Welfare Act, 1918, and also the approximate number of such authorities, distinguishing between county boroughs, county councils, urban districts, and rural districts, that had submitted for his sanction under that Act arrangements for provision for expectant and nursing mothers and children under 5 years not in attendance at school.—Mr. CHAMBERLAIN replied: The following is the information asked for: There are 1856 local health authorities (including county councils) in England and Wales which are empowered to take action, with the sanction of my department, under the Maternity and Child Welfare Act, 1918. Provision has been made for maternity and child welfare in every sanitary district in the country, either by the county council or the local sanitary authority. The authorities at present making provision are 60 county councils, 83 county borough councils, 150 borough councils, 135 urban district councils, and 18 rural district councils.

Mr. MONTAGUE asked the Minister of Health the terms of the recent circular to local authorities intimating a maximum expenditure which would be recognised for grant-in-aid of the supply of milk for expectant and nursing mothers and children; to which authorities the circular was sent; and the estimated saving to the Treasury.—Mr. CHAMBERLAIN replied: No such circular has been issued, but in the letters which were sent to some local authorities last March, informing them of the maximum expenditure for maternity and child welfare work during the current financial year which could be recognised for grant, certain suggestions as to procedure were made, with a view to enabling the authorities to keep their expenditure on milk within the amounts approved for grant. This letter was sent only to the authorities whose estimated expenditure on milk exceeded £100, and, moreover, was not addressed to those whose districts are situated in distressed mining areas in Durham, Lancashire, Northumberland, and South Wales. The total estimated saving in grant is about £12,000.

Prescription of Liver Extract to Insurance Patients.

Mr. AMMON asked the Minister of Health whether panel doctors might prescribe liver extract in cases of pernicious anæmia; and would such be accepted as a legitimate charge on the National Health Insurance Fund.—Mr. CHAMBERLAIN replied: The decision of the question whether this or other preparations can be regarded as drugs or medicines within the meaning of the National Health Insurance Acts rests primarily with insurance committees. But, in response to inquiries made on behalf of committees, I have indicated that there is nothing before me to suggest that this preparation could properly be regarded as being excluded from the scope of medical benefit in any cases in which it is requisite for the patient's treatment.

Claims for Sickness, Disability, and Maternity Benefits.

Mr. RHYS DAVIES asked the Minister of Health whether the claims for sickness, disability, and maternity benefits from approved societies were now decreasing or otherwise; and if he would show the amounts on the basis of comparisons for previous periods.—Mr. CHAMBERLAIN replied: The following statement gives an approximate comparison of the benefit expenditure of approved societies in England and Wales in 1926 and 1927, with the expenditure in 1925. Allowance has been made for variations in additional benefits, &c., in order to make the figures for the various years as far as possible comparable.

—		Percentage ratio of expenditure in undermentioned years to expenditure in 1925.	
		1926.	1927.
		Per cent.	Per cent.
Sickness benefit	Men ..	116	113
	Women ..	108	112
Disablement benefit	Men ..	113	124
	Women ..	114	126
Maternity benefit	Men ..	95	90
	Women ..	105	103

Complete information relating to 1926 to date is not available, and direct comparison with previous years is impracticable owing to the cessation, since January last, of the right to sickness and disablement benefit in the case of persons over age 65. An examination of the expenditure of certain large societies in the first half of 1928 indicates broadly, after allowing approximately for the above-mentioned cessation, that the expenditure on sickness benefit in this period was rather less than in the corresponding period of the preceding year in the case of both men and women. In this connexion it will be appreciated that a severe influenza epidemic materially affected the claims in the early months of 1927. The cost of disablement benefit was, however, somewhat heavier in 1928 in respect of each sex.

Poor-law Statistics.

Sir WALTER DE FRECE asked the Minister of Health the proportion of the estimated population in receipt of poor-law relief on Jan. 1st, 1914, and in each of the last 10 years.—Mr. CHAMBERLAIN replied: The proportion per 10,000 of the estimated population of all persons in receipt of poor-law relief on or about Jan. 1st in the years 1914, and 1918 to 1928 was as follows:—

Year.	Rate per 10,000*	Year.	Rate per 10,000*	Year.	Rate per 10,000*	Year.	Rate per 10,000*
1914	208	1920	154	1923	403	1926	370
1918	156	1921	177	1924	357	1927	396
1919	148	1922	394	1925	311	1928	347

* Rate per 10,000 of estimated population, of persons in receipt of poor-law relief.

Sir WALTER DE FRECE asked the Minister of Health the total number of casuals relieved in England and Wales in 1914, and in each of the last ten years.—Mr. CHAMBERLAIN replied: The following statement shows the number of casuals in receipt of poor-law relief in England and Wales on or about Jan. 1st in the years 1914, and 1919 to 1928:—

Year.	Casuals.*	Year.	Casuals.*	Year.	Casuals.*
1914	7,568	1922	6,572	1926	8,294
1919	1,091	1923	7,628	1927	10,737
1920	2,035	1924	7,794	1928	10,497
1921	4,084	1925	7,664		

* Number of casuals in receipt of poor-law relief.

Mr. DUCKWORTH asked the Minister of Health what proportion of the rates per head paid in the years ending March 31st, 1914, 1924, 1925, 1926, and 1927 were for the relief of the poor, and purposes connected therewith; and how much for other purposes.—Mr. CHAMBERLAIN replied: The following statement gives the desired information:—

Year ended March 31st.	Average amount of rates collected per head of estimated population.		
	For relief of the poor and purposes connected therewith.*	For all other purposes.*	Total.
	s. d.	£ s. d.	£ s. d.
1914 ..	6 5	1 12 6	1 18 11
1924 ..	16 11	2 17 8	3 14 7
1925 ..	16 1	2 17 2	3 13 3
1926 ..	16 2	3 0 3	3 16 5
1927 ..	19 2	3 2 6	4 1 8

*Approximate.

Overcrowding at the Newington Institution.

Mr. DAY asked the Minister of Health whether his attention had been drawn to the inadequate accommodation and overcrowding at the Newington Institution, particularly with reference to the shortage of hospital beds where serious overcrowding had taken place each winter for several years past; and in view of the fact that certain essential improvements in the receiving wards, nursery, and other receiving departments of the Newington Institution had been repeatedly urged by the inspector of the Ministry of Health, what steps his department were taking in the matter.—Mr. CHAMBERLAIN replied: I am aware that some additional accommodation is required at this institution, but I am unable at the present time to contemplate the approval of the scheme that has been submitted by the Southwark Board of Guardians, which involves an expenditure of at least £100,000. My officers have already made suggestions designed to meet the immediate needs of the institution.

Artificial Light Treatment for School-children.

Dr. VERNON DAVIES asked the President of the Board of Education what steps he took to provide that artificial light treatment for the school child was only given by properly qualified persons.—Lord E. PERCY replied: In many cases artificial light treatment for children attending public elementary schools is provided at the light department

of a general hospital under an arrangement between the local education authority and the hospital authorities. Treatment at a school clinic is allowed only on condition that a medical officer with special experience of artificial light therapy will be in charge, and that he will be assisted by a nurse who has also had special experience of this work.

Tuberculosis in the Navy.

Sir A. SHIRLEY BENN asked the First Lord of the Admiralty whether the rules and principles governing the assessment of attributability in tuberculosis cases in the Royal Navy had been investigated; and, if so, what decision had been reached by the Board of Admiralty.—Lieut.-Colonel HEADLAM (Parliamentary Secretary to the Admiralty) replied: The Board of Admiralty have made the most careful and exhaustive inquiry into the incidence of tuberculosis in the Navy with particular reference to the question whether, in the matter of pension awards following invaliding for this disease, there is adequate recognition of causes peculiar to the conditions of naval service afloat to which tuberculosis might be regarded as attributable. As a result of this investigation they have come to the conclusion that although the rules and principles governing the assessment of attributability in tuberculosis cases have in the past been correctly formulated there are grounds justifying more generous treatment in many of these very distressing cases, and they have decided that in respect of invalidings as from Oct. 1st last there should be such a modification of these rules and principles as will very considerably reduce the percentage of cases in which "non-attributable" awards only can be regarded as appropriate. These arrangements are, of course, without prejudice to the consideration of any recommendations which may be embodied in the report on this question which is expected shortly from the Joint Medical Services Committee.

Small-pox in the Army.

Mr. KELLY asked the Secretary for War whether he was now in a position to publish the statistics of the small-pox cases and deaths recorded in the British Army in every part of the world during the years of the war.—Sir L. WORTHINGTON-EVANS replied: The official History of the War (Medical Services, Hygiene of the War, Vol. II.) gives a good deal of general information as to small-pox. A statistical volume of the medical history of the war is in course of preparation, but I am unable to say to what extent it will be possible to deal with the statistics of any particular disease.

MONDAY, NOV. 19TH.

Government and Radium Supplies.

Sir H. BRITTAIN asked the Prime Minister whether, in view of the increased demand for radium for curative purposes and of the uneconomical character of purchases of small quantities by institutions, he would consider rendering Government assistance in obtaining supplies.—Sir K. WOOD (Parliamentary Secretary to the Ministry of Health) replied: The whole question of the radium requirements of this country in relation to present sources of supply is at present under consideration by a subcommittee of the Committee of Civil Research.

Use of Electrotherapy.

Dr. VERNON DAVIES asked the Minister of Health if his department was in any way responsible, by means of grants or otherwise, for the use of electrotherapy in the treatment of disease; and, if so, what steps were taken to insure that the treatment was only given by properly qualified persons.—Sir K. WOOD replied: Yes, Sir. Electrotherapy is practised in public institutions dealing with tuberculosis, with maternity and child welfare, and with the care of the pauper sick. It is a condition of any grant that the medical officer using such means of treatment should be specially qualified or experienced, and the treatment provided in a poor-law institution is always under the direction of a qualified medical practitioner.

TUESDAY, NOV. 20TH.

Smoke Abatement.

Commander BELLAIRS asked the Minister of Health whether he could make a statement as to any progress achieved as the result of the Public Health (Smoke Abatement) Act, 1926.—Mr. CHAMBERLAIN replied: There are now five Regional Advisory Committees, including one for Greater London, and one Executive Committee with administrative powers. An Order has been made bringing new processes under the operation of the *Alkali Act*. By-laws as to the emission of black smoke have been approved for a number of local authorities, and generally there is a marked quickening of interest and activity in the work of smoke abatement.

National Health Insurance Contributions.

Mr. RILEY asked the Minister of Health the respective contributions of the State, the employers, and the insured persons to the National Health Insurance Fund for the year 1927–28.—Sir K. WOOD replied: As the National Health Insurance Fund accounts are made up for calendar years, figures for the financial year are not readily available. For the year 1927 the approximate contributions of employers and insured persons in England and Wales were: Employers, £11,866,000; insured persons, £11,748,000. The State contribution, which represents the statutory proportion of the cost of benefits and administration, together with the cost of central administration, was, in 1927, £6,842,000.

The Price of Milk.

Mr. R. MORRISON asked the Minister of Agriculture the total annual additional sum which would be charged to the milk consumers of the metropolitan area under the recently arranged agreement between the milk distributors and the National Farmers' Union.—Mr. GUINNESS replied: It has been stated that the retail price charged by distributors will be increased by 1*d*. per quart in the months of April and September, 1929. The consumption of milk per head per day in this country has been estimated at approximately one-third of a pint, and on this basis the additional average cost would be 10*d*. per head for the two months. Taking the population of Greater London at 7,810,000, this is equivalent to £325,400.

Obituary.

EDWARD KNIGHT, M.R.C.S., L.S.A.

ON Oct. 26th died Edward Knight, who was for long a senior demonstrator, chief assistant, and subsequently sole director of Cooke's School of Anatomy in Handel-street, London. It will be remembered that at the end of last century this establishment was the only private medical school in the United Kingdom which was licensed to keep a dissecting room and recognised to take students during the curriculum. Edward Knight was born in 1859, pursued his medical studies at University College and Middlesex Hospitals, and qualified L.S.A. and M.R.C.S. in 1889. He specialised early in anatomy, for his book, "A Plea for Practical Anatomy," was published not many years after he became qualified, and most of his life was spent in the dissecting room and lecture theatre. Many who were not necessarily idlers are still grateful for the help in their anatomy afforded them at "Cooke's School." The extraordinarily systematised and intensive courses allowed of a rapid survey of the naked-eye anatomy in the shortest possible space of time. Edward Knight was exceptionally gifted in carrying on instruction by means of quick question and answer on the dissected part. He was of a cheerful, even jocular, disposition, and had a handsome and somewhat commanding person. He was, therefore, well adapted to hold the attention of those who had least "learnt to learn," while many candidates for the Primary Fellowship found it helpful to be put rapidly through their paces by this energetic and sprightly coach.

Sir James Dundas-Grant writes: "Knight had naked-eye anatomy at his fingers' ends and knew Cooke's wonderful tablets through and through. These 'tablets' presented pretty solid doses of anatomy in a most condensed form, in which the regional and systematic methods were cleverly blended. The work for the teacher was extremely hard, and there is every probability that the strain, even on this vigorous man, led to the progressive muscular atrophy which after a considerable number of years of poor health led to his death."

Many of his pupils have no doubt predeceased him, but there must be still a number remaining who will remember him with gratitude.

Medical News.

UNIVERSITY OF OXFORD.—An examination for a Radcliffe Travelling Fellowship, of the annual value of £300 and tenable for two years, will be held during Hilary Term, 1929, at the University Museum, commencing on Feb. 12th at 10 A.M. Candidates must have passed all the examinations required by the University for the degree of Bachelor of Arts and for the degree of Bachelor of Medicine, the latter within the last four years. The successful candidate must devote himself during the period of his tenure of the Fellowship to the study of medical science and to travel abroad with a view to that study. At the examination papers will be set in physiology, pathology, and preventive medicine, and a subject will be proposed for an essay. There will also be a practical examination in pathology. Intending candidates should send their names, addresses, and qualifications to the Regius Professor of Medicine, University Museum, on or before Jan. 30th.

UNIVERSITY OF LONDON.—Prof. G. E. Gask has been elected Dean of the Faculty of Medicine for the period 1928–30, and Prof. L. N. G. Filon Dean of the Faculty of Science.

OLD EPSOMIAN CLUB.—The annual dinner of this club will be held at the Trocadero Restaurant, Piccadilly-circus, at 7.30 P.M., on Thursday, Dec. 13th.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION.—The next quarterly meeting of this Association will be held to-day (Friday), Nov. 23rd, at the British Medical Association House, Tavistock-square, London, W.C., under the presidency of Prof. J. Shaw Bolton, when a discussion will be held on certain points raised in papers on general paralysis read by Dr. J. Brander and Dr. J. F. Smyth at the annual meeting.

ANTENATAL METHODS WITH SPECIAL REGARD TO DISPROPORTION.—A discussion on this subject will be held at a meeting of the Maternity and Child Welfare Group of the Society of Medical Officers of Health at the Royal Free Hospital, Gray's Inn-road, London, W.C., to-day, Friday, at 8 P.M. Prof. L. McIlroy, Mr. Eardley Holland, Prof. F. J. Browne, Dr. Annie McCall, Mr. Aleck Bourne, and Mr. Lane Roberts will speak.

NATIONAL INSTITUTE FOR THE DEAF.—Two lectures entitled the Wonders of Hearing and Facts on Deafness are to be given at 8 P.M. on Tuesday, Dec. 4th and 11th, at the Eustace Miles Restaurant, 40, Chandos-street, London, W., by Mr. C. M. R. Balbi, A.M.I.E.E., consulting electrical adviser to the Institute. Seats will be reserved for those who send a stamped addressed envelope to the Secretary at 2, Bloomsbury-street, W.C. 1, and unreserved seats will be open to the public.

POST-GRADUATE COURSE OF LECTURES ON CANCER. A series of four lectures will be held at the Medical School, Leeds, at 3.30 P.M. on Nov. 28th, Jan. 9th, Feb. 13th, and March 13th. The first will be on Cancer of the Breast, by Prof. A. H. Burgess; the second on Lead in the Treatment of Cancer, by Prof. W. Blair Bell; the third on the Lessons of the Recent Researches in Cancer, by Dr. A. Leitch; and the fourth on Cancer and the General Practitioner, by Mr. Cecil Rowntree. The lectures, the first three of which are to be illustrated by lantern slides, will be free to members of the profession.

ALLIANCE LODGE: *Installation and Banquet.*—The M.W. the Pro Grand Master, the Right Hon. Lord Ampthill, was present on Nov. 14th at the Installation Meeting of the Alliance Lodge, No. 1827, which celebrated the jubilee of the Lodge. Some 80 brethren, including a considerable number of grand officers, and many distinguished in the craft and medical profession, attended at the Café Royal in the afternoon, when W. Bro. H. Moreland McCrea, M.D., opened the Lodge. The M.W. the Pro Grand Master Lord Ampthill, assisted by the retiring Master, installed W. Bro. Ernest Clarke, F.R.C.S., P.M., P.G.D., as Master for the ensuing year, and subsequently delivered the addresses. The W.M. invested the following officers: I.P.M., W. Bro. H. Moreland McCrea; S.W., W. Bro. R. E. Sare; J.W., Bro. H. W. Carson, F.R.C.S.; Treasurer, W. Bro. J. S. Cotman, F.C.A., P.M., P.A.G.D.C.; Secretary, W. Bro. C. O. Hooper, F.C.A., P.M.; D.C., W. Bro. A. J. Clark, B.A., P.M.; S.D., Bro. B. B. Stenham, LL.B.; J.D., Bro. F. G. H. Holt; Organist, W. Bro. W. Sparks, P.M., P.G.D.; I.G., Bro. V. C. Dunfee; Stewards, W. Bro. Sir Holburt Waring, F.R.C.S., P.M., L.R., W. Bro. M. A. Nicholas, P.M.; and Tyler, Bro. T. Davis. The M.W. the Pro Grand Master was elected to honorary membership of the Lodge. The banquet was held at the Café Royal in the evening.

MEDICO-LEGAL SOCIETY.—The annual dinner of this Society will be held at the Holborn Restaurant, London, on Friday, Dec. 14th, at 7 for 7.15 P.M. Sir William Willcox, the President, will preside.

BRITISH DENTAL HOSPITAL.—The annual meeting will be held at 23, Russell-square, London, W.C., on Nov. 29th, at 8 P.M. Sir Harry Baldwin, the President, will take the chair, and Dr. Leonard Williams will speak on the Arch of the Buccal Building.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.—A meeting will be held on Nov. 28th at St. John's Hospital, 49, Leicester-square, London, W.C., at 4.15 P.M. Clinical cases will be shown, and at 5 P.M. Dr. S. P. Bedson will read a paper entitled Observations on the Nature of Filtrable Viruses and their Bearing on the Ætiology of Herpes and Allied Conditions.

COLCHESTER HOSPITAL.—The accommodation for nurses at this hospital is so inadequate that some of them have to sleep three in a room. It has therefore been decided to extend the nurses' home at a cost of £30,000. The hospital serves 50 or 60 villages, some of which are making themselves responsible for the cost of a room in the new building.

PARAFFIN WAX IN BEEF DRIPPING. — On Nov. 15th, at Birkenhead police-court, a firm of manufacturers was fined £10 and £1 11*s.* 6*d.* costs for consigning a quantity of beef dripping which contained 8·4 per cent. of paraffin wax to a stallholder in the Birkenhead Market. Mr. H. E. Davies, public analyst, had stated that the paraffin wax was not only an adulterant, but might set up indigestion in anyone consuming the dripping.

HULL INFIRMARY EXTENSIONS.—Princess Mary, on Nov. 13th, laid the foundation-stone of the Sutton-on-Hull Annexe to the Royal Infirmary, Hull. The annexe is eventually to be enlarged to form an auxiliary hospital of 100 beds built on a site given by Mr. P. B. Reckitt, of Hull, and the Princess also declared open an extension of the out-patients' department of the infirmary, which has cost £10,000.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.—Lectures and practical courses of instruction for the first part of this diploma will be held at the Maudsley Hospital, beginning on Jan. 8th, 1929. Lectures will be given on physiology, physiological psychology, biochemistry, anatomy and psychology, by Dr. F. Golla, Mr. S. A. Mann, Prof. G. Elliot Smith, and Dr. Henry Devine; and in addition four lectures on psychological mechanisms will be given by Dr. Edward Mapother.

A course for the second part of the diploma will be held from March to May inclusive. Inquiries should be addressed to the Director of the Central Pathological Laboratory, Maudsley Hospital, Denmark-hill, London, S.E.5.

DARENTH TRAINING COLONY, DARTFORD.—The Metropolitan Asylums Board has approved of the erection of a new nurses' home at a cost of over £40,000. The Mental Hospitals Committee reported that the cubicles on the top floor accommodating 46 of the female staff are dangerous in case of fire; that the nurses' sleeping quarters were scattered over the colony; and that some nurses had to use patients' baths in large bathrooms through which other nurses have to pass while bathing is in progress.

DONATIONS AND BEQUESTS.—The late Colonel D. Lewis, J.P., of Swansea, left, among other bequests, £10,000 to Gorseinon Hospital, £3000 to Swansea General and Eye Hospital, £500 each to Swansea and South Wales Institution for the Blind, the Royal Cambrian Institution for the Deaf and Dumb, Swansea, and Swansea Orphan Home for Girls.—The late Mr. T. A. Fisher, of Northampton, left, among other bequests, £500 to Northampton General Hospital for endowing a bed, and on his wife's death £2000 to Northampton and County Crippled Children's Fund, £500 to Northampton General Hospital, £300 to the Northampton and County Association for Promoting the General Welfare of the Blind, £300 to Victoria Nursing Home, Northampton, and the ultimate residue of the property equally between Dr. Barnardo's Homes and Moorfields Eye Hospital, London.—By will the late Dame Grace Revere Osler, widow of the late Sir William Osler, left £10,000 to the McGill College, Montreal, Canada, for the upkeep of the Osler Library; £5000 to the Jefferson Medical College, Philadelphia, United States, for the establishment of a Lectureship in Surgery, in memory of Dr. Samuel W. Gross, her first husband; £2000 to the Tudor and Stuart Club or Library of the Johns Hopkins University, Baltimore, United States; £2000 to the Radcliffe Infirmary, Oxford, for the Osler Pavilion; £600 to the Gross Library at the College of Physicians, Philadelphia; £200 each to the Acland Home, Oxford, and the District Nurses' Association, Oxford.

ALVARENGA PRIZE.—The College of Physicians of Philadelphia announces that the next award of this prize, amounting to about $300, will be made on July 14th, 1929. An essay intended for competition may be upon any subject in medicine, but must not have previously appeared in print, or been presented elsewhere in competition for a prize. Essays must be received on or before May 1st, 1929, by the secretary of the College at 19, South-22d-street, Philadelphia, Pa., U.S.A., from whom further particulars may be obtained.

The Alvarenga prize for 1928 has been awarded to Dr. J. R. Paul and Dr. W. U. McClenahan, Philadelphia, for the essay entitled A Pathological Study of the Pleural and Pulmonary Lesions in Rheumatic Fever.

PUBLIC HEALTH CONGRESS DINNER.—On Nov. 20th Sir Frederick Willis presided at a banquet at the Savoy Hotel. The Rt. Hon. H. P. Macmillan, proposing the toast "Parliament," defended the parliamentary system of legislature, despite its delays and exasperations, and paid a tribute to the loyal work done in Committee. He thought it a mistake to have too many professional men in Parliament; the duty of Parliament was to be constructive, and professional men were apt to be destructive and critical. Adequate representation of the medical profession, however, was essential. Dr. A. Vernon Davies responded, and described the sorrows of a Member's lot. "The Public Health Services" was proposed by Sir Henry Keith, who criticised the proposed rating reforms, which, he thought, would be disadvantageous to many public health services. The toast was acknowledged by Dr. W. M. Willoughby, who said that in the English people there was a genius for or an inculcated habit of health, and they had carried the public health idea throughout the world. Sir Edmund Barnard proposed the health of the chairman, who described the origin of the Congress and its object in bringing together the practical and scientific side of public health work (see p. 1079). He related his part in elevating the Local Government Board from a junior branch to one of the most important departments of State. The Congress was designed to enhance still further the importance of the public health administration. It was hoped to found a Chair of Public Health at a university. Progress could only be made by constant research, constant application of research, and the devotion of Government officials. He hoped the Congress would become a biennial institution, and proposed the health of the secretaries. Mr. Warner Terry replied.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.—Dr. J. Howard-Jones, the President, took the chair at the annual dinner of this Society, held at the Piccadilly Hotel London, on Nov. 15th. The toast of the Society was proposed by Mr. H. P. Macmillan, K.C., late chairman of the Royal Commission on Lunacy and Mental Disorder, who spoke of the debt owed by the public to their medical officers. He believed that the health of the people had been enormously benefited by recent legislation and its administration by members of the Society. There was a certain risk of too much interference with the lives of individuals, and the aim, he thought, should be not to do things for people but to teach them to do things for themselves. An immense amount of educative work was being done and was being reflected in the homes of the population. Dr. Howard-Jones, in responding, spoke of the vital statistics of the Society, which was now in its period of growth. Its 13 branches extended to India and the Malay States, but there was as yet no branch in Ireland. Preventive medicine—theoretically the greatest department of medicine—was now invading the other departments; yet the cost of the work controlled by M.O.H.'s throughout the country worked out at only 6s. 3d. per head of the population per annum. Dr. Howard-Jones believed that the interchange of medical officers was probably doing more to promote international goodwill than any other activity of the League of Nations. He concluded by speaking of the Society's secretary, Mr. G. S. Elliston, who had won the admiration and respect of every member. Dr. Charles Porter proposed the toasts of the Guests in a singularly happy speech devoted chiefly to their recreations. He apparently believed that public men should have no time for recreation. In reply, Dr. Haden Guest pleaded for more scientific thought in politics and public affairs. Over questions of public health there was seldom great excitement, the reason being that they had been properly weighed and analysed. There ought to be a conquest of other political questions by quiet-minded people. As we approached the general election there was less and less sober consideration of national problems, yet they needed as careful examination as the problems of local administration or science. He wished that there could be at least 50 medical M.P.'s and three medical Ministers. Dr. H. B. Brackenbury, chairman of Council of the British Medical Association, said that the distinction between curative and preventive medicine was becoming less and less real. Practitioners were now called upon to do both preventive and curative work. Mr. Henry Lesser, President of the National Association of Insurance Committees, referred to the need of coöperation between insurance organisations and the M.O.H. Councillor Walter Griffiths, Mayor of Newport, spoke warmly of the admirable work of the President for the town of Newport and for the mercantile marine, and Prof. H. Kerr proposed Dr. Howard-Jones's health. After this had been drunk with musical honours, the President briefly replied.

During the evening Mr. Charles Pond entertained the company with great success.

CONGRESS OF RADIOLOGY DINNER.—In the course of the Congress arranged jointly by the British Institute of Radiology and the Rontgen Society (reported in another column) a dinner was held at the Trocadero Restaurant, at which the President, Dr. G. W. C. Kaye, occupied the chair. After the loyal toast a silent tribute was paid to the memory of Dr. Robert Knox. Mr. Cuthbert Andrews proposing "The Institute," coupled with the name of the chairman, recalled the fact that while the combined society was only a year old, difficulties had already been overcome, and although the organisation and working were still far from perfect, with the active coöperation of every member the Institute was on the way to becoming a powerful body whose influence would be international. The President in his reply referred to the work of Béclère, J. J. Thomson and Rutherford to whom radiology was so deeply in debt, and recorded his appreciation of the efforts of the manufacturers to make the November meeting and exhibition a success. The forthcoming joint meeting of the Institute of Electrical Engineers and the British Institute of Radiology would, he felt sure, bring much benefit to radiology, and he terminated his remarks by assuring those present that the Institute would grow into a great and powerful body. Dr. A. L. Rowden, Vice-President, proposed "The Guests," associating with the toast the names of Sir Thomas Horder, Mr. H. T. Tizard, Lieut.-Colonel K. Edgcumbe, President of the Institute of Electrical Engineers, Mr. W. Sampson Handley, Mr. A. J. Walton, Dr. J. E. A. Lynham, and Sir Humphry Rolleston, Past President of the Institute. Sir Thomas Horder, in reply, referred to his long association with the late Dr. Knox and other pioneers. In view of the turn given by the press to certain remarks of his made at the Congress he took pains to assure his listeners that he found the assistance given by radiology in clinical work second to none. Mr. Tizard registered his appreciation of the close contact necessary between science and medicine, well exemplified in their combined society. Colonel Edgcumbe felicitated the society on the good work done at the recent international congress where the British view of the protection question had been adopted in its original form. Sir Humphry Rolleston proposed "The President," and Dr. Kaye, in reply, thanked the office-bearers, not forgetting the dinner committee, for their timely interest and assistance, and in his turn proposed "The Past President." Auld Lang Syne was heartily sung in conclusion.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, Nov. 26th.—8 P.M., ODONTOLOGY. Paper: Dr. E. W. Fish: Dead Tracts in Dentine. Casual Communication: Sir Frank Colyer: Irregularities of the Teeth in Erythrocebus (Patas Monkey).

TUESDAY.—5 P.M., MEDICINE. Clinical Meeting at University College Hospital, Gower-street. Cases: Dr. Poynton: Pernicious Anæmia in a Young Girl. Dr. Goodhart: Two Cases of Splenomegalic Familial Jaundice with Severe Crises of Anæmia. Dr. Elliott: Biliary Cirrh[illegible] and Hyper-cholesterinæm[illegible] Blood Picture of Pernicious [illegible] a and Unusual Renal Radiogram. Dr. McNee: [illegible]lenectomy for Aleukæm[illegible] H. A. Harris: Paget's Osteitis [illegible] [illegible]njury to Hip: Radiogram of [illegible] Dr. K. E. Harris: Paroxysm[illegible] [illegible]d by Resection of Gastric [illegible] [illegible]rta and High Blood Pressure [illegible] Familial Polycystic Kidneys [illegible]

WEDNESDAY. [illegible] MEDICINE. Paper: Dr. William G. Savage: Unsolved Problems of Salmonella Food Poisoning.

THURSDAY.—8.30 P.M., Sir William Bragg: Faraday's Diary, with illustrations and exhibits. Lloyd Roberts Lecture. (Admission by ticket only.)

CAL SOCIETY OF LONDON, 11, Chandos-street, ndish-square, W.
ONDAY, Nov. 26th.—8 P.M.: Clinical Evening.

L INSTITUTION, Albemarle-street, W.
HURSDAY, Nov. 29th.—5.15 P.M., Dr. E. D. Adrian, F.R.S.: The Mechanism of the Nerves.

AL SOCIETY OF ARTS, John-street, Adelphi, London, .
IONDAY, Nov. 26th.—8 P.M., Dr. Franklin Kidd, D.Sc.: Biology and Refrigeration. (Lecture III.)

ICAL SOCIETY FOR THE STUDY OF VENEREAL SEASES, 11, Chandos-street, Cavendish-square, W.
FRIDAY, Nov. 30th.—8.30 P.M., General Meeting. A paper will be read by the President, Dr. F. J. H. Coutts, on Venereal Diseases from the Epidemiological Point of View. A discussion will follow.

ECTURES, ADDRESSES, DEMONSTRATIONS, &c.

LOWSHIP OF MEDICINE AND POST-GRADUATE EDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Nov. 26th, to SATURDAY, Dec. 1st.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Lecture by Dr. Donald Paterson: Some Problems in Infant Feeding, on Mon., at 5 P.M. Mr. Victor Bonney, at the Medical Society, on Gynæcological Talk. Wed., 11 A.M.—CENTRAL LONDON OPHTHALMIC HOSPITAL, Judd-street, W.C. Thurs., at 4 P.M. Demonstration by Mr. Cunningham.—PRINCE OF WALES'S GENERAL HOSPITAL, Tottenham, N. Mon., at 2.30 P.M. Dr. A. J. Whiting (Ward Round).—WELLCOME MUSEUM OF MEDICAL SCIENCE, 33, Gordon-street, W.C. Wed., at 4 P.M. Demonstration by Dr. Philip Manson-Bahr on Prevention and Treatment of Malaria. The above are free.—ROYAL WATERLOO HOSPITAL, Waterloo-road, S.E. Special course in Medicine, Surgery, and Gynæcology.—ROYAL WESTMINSTER OPHTHALMIC HOSPITAL, Broad-street, Holborn, W.C. Special Course.—ST. PETER'S HOSPITAL, Henrietta-street, W.C. Special Course in Urology.—WEST END HOSPITAL FOR NERVOUS DISEASES, 73, Welbeck-street, W. At 5 P.M. Lecture-demonstrations, illustrated by cases daily.—LONDON LOCK HOSPITAL, Dean-street, W. Clinical instruction in O.P. Department. Further information from the Secretary.

VEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, Nov. 26th.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards 2 P.M., Mr. Simmonds: Surgical Out-patients.
TUESDAY.—11 A.M., Mr. Endean: Venereal Diseases (demonstration). 2 P.M., Dr. Shaw: Medical Out-patients. 2 P.M., Mr. Hamblen Thomas: Throat, Nose and Ear Department.
WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. 2 P.M., Mr. Tyrrell Gray: Operations. 2.30 P.M., Mr. Donald Armour: Surgical Wards. 4.30 P.M., Dr. Carter Braine: X Ray Therapy.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 2 P.M., Dr. Ironside: Medical Out-patients. 2 P.M., Mr. Bishop Harman: Eye Department.
FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department.
SATURDAY.—9 A.M., Mr. Vlasto: Operation on Throat, Nose and Ear. 9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Diseases of Children.
Daily 10 A.M. to 5 P.M., Saturdays 10 A.M. to 12 noon. Medical and Surgical In-patients and Out-patients. Operations, Special Departments, Anæsthetic Course.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL.
MONDAY, Nov. 26th.—4.15 P.M., Dr. Charles Singer: Plague. Second lecture on the History of Medicine.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, Nov. 26th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.
WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin and Eye Clinics. Operations.
THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.
FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M. Surgical, Medical, and Children's Diseases Clinics. Operations.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY, Nov. 27th.—5 P.M., Dr. A. Whitfield: Tuberculosis Cutis (2).
THURSDAY.—5 P.M.: Dr. H. Haldin-Davis: Acne. Rosacea.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, Nov. 29th.—4 P.M., Dr. Pearson: Constipation.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, Nov. 30th.—4 P.M., Mr. Watkyn-Thomas: Two Cases of Brain Abscess.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.
TUESDAY, Nov. 27th.—3.15 P.M. (at the Royal Chest Hospital), Mr. S. J. F. Webb: The Need of Removal or Conservation of Teeth in Relation to Systemic Disease

ST. PAUL'S HOSPITAL POST-GRADUATE COURSE, Endell-street, W.C.
THURSDAY, Nov. 29th.—4.30 P.M., Mr. Kenneth Walker: The Enlarged Prostate.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.
WEDNESDAY, Nov. 28th.—4 P.M., Dr. H. M. Vernon: The Fatigue of Heavy Industrial Work, and its Influence on Health and on the Duration of Working Life. (With lantern illustrations.)

JOINT TUBERCULOSIS COUNCIL POST-GRADUATE COURSES.
MONDAY, Nov. 26th, to SATURDAY, Dec. 1st.—A Post-Graduate Course of Lectures and Demonstrations on the Pathology of Tuberculosis and Allied Chest Diseases will be held at the City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E. Further particulars from Dr. W. Brand, The Larches, Farnham Royal, Bucks.

CHADWICK PUBLIC LECTURES.
MONDAY, Nov. 26th.—7.30 P.M. (in the University College of the South West, Exeter), Dr. P. B. Ballard: Open Air Schools.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.
TUESDAY, Nov. 27th.—4.15 P.M., Mr. D. L. Sewell: Foreign Bodies in Food and Air Passages.
FRIDAY.—4.15 P.M., Dr. G. E. Birkett: General Principles of Radium Therapy.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.
FRIDAY, Nov. 30th.—3.30 P.M., Mr. Cu : Surgical Cases.

Appointments.

ADAM, J. N., M.B., Ch.B. Edin., F.R.C.S. Edin., has been appointed Hon. Surgeon to the Chester Royal Infirmary.
ANGUS, W. B. G., M.D. Camb., F.R.C.S. Edin., a Medical Referee under the Workmen's Compensation Act for the District of Stirling, Dumbarton and Clackmannan.
GLAISTER, J., jun., M.D., Ch.B. Glasg., Professor of Forensic Medicine in the University of Cairo and Medico-legal Adviser to the Egyptian Government and Courts.
LEASK, R. L., M.B., Ch.B. Glas., D.P.H., Assistant Tuberculosis Officer for the Eastern Division of the County of Fife.
LISTER, A. R., M.B., B.Chir. Camb., F.R.C.S. Eng., Assistant Surgeon, York County Hospital.
LORD, J. R., C.B.E., M.D., C.M. Edin., Hon. Lecturer in Clinical Psychiatry, London School of Medicine for Women.
O'DOHERTY, M. I., M.B., B.Ch. N.U.I., Medical Officer of Nobber, Meath.
WILSON, W. ETHERINGTON, F.R.C.S. Eng., Hon. Consulting Surgeon to Totnes and District Cottage Hospital, Devon.
Certifying Surgeons under the Factory and Workshop Acts: BLORE, W. R., M.B., B.S. Lond., M.B., Ch.B. Manch. (Halesowen, Worcester); and PARGETER, H. A. A., M.B., B.Chir. Camb. (Dunstable).

Vacancies.

For further information refer to the advertisement columns.

All Saints' Hospital for Genito-Urinary Diseases, 91, Finchley-road, N.W.—Hon. Anæsthetist.
Barnsley, Beckett Hospital and Dispensary.—Jun. H.S. £140.
Birmingham, [illegible] —Jun. M.O. £300.
Birmingham [illegible] n Physiology. £400.
Bootle Borou [illegible] th. Surg.
Bradford, Ro [illegible] urg. O. £250.
Brighton, Bo [illegible] *Hospital and Sanatorium.*—Res. M.O. £350.
Bristol General Hospital.—Hon. Clin. Assts.
Bristol. Ham Green Fever Hospital and Sanatorium.—Asst. Res. M.O. £300.
Buxton, [illegible] H.P. At rate of £150.
Cambrid [illegible] *Laboratory.*—John Lucas Wa [illegible] —H.S. At rate of £100.
Cancer [illegible] Also Surg.
Cardiff Royal Infirmary.—H.S., Aural H.S. Also Cas. Surg. O. Each at rate of £50.
Carlisle, Cumberland and Westmorland Mental Hospital, Garlands.—Asst. M.O. £350.
Central London Throat, Nose and Ear Hospital, Gray's Inn-road, W.C.—Asst. Surg.
Charing Cross Hospital, W.C.—2nd Surg. Registrar. £150.
Chelsea Hospital for Women, Arthur-street, S.W.—Jun. H.S. At rate of £100.
City of London Maternity Hospital, City-road, E.C.—Asst. Res. M.O. At rate of £80.
Croydon General Hospital.—Res. M.O. £200.
Dagenham Urban District Council.—Asst. M.O. for Maternity and Child Welfare. £600.
Dorset Mental Hospital, Herrison, Dorchester.—Jun. Asst. M.O. £300.

Dreadnought Hospital, Greenwich, S.E.—Asst. Pathologist to London School of Clin. Med. £350. Also Med. Supt. £300.
Durham, Richard Murray Hospital, Blackhill.—Res. M.O. £450.
Guildford, Royal Surrey County Hospital.—Hon. Ophth. S. Also Hon. Asst. S.
Hendon Cottage Hospital, N.W.—Hon. Asst. Aural Surg.
Hexham Rural District Council.—Asst. County M.O. &c. £800.
Hospital for Consumption, &c., Brompton, S.W.—Sen. and Jun. H.S. for Frimley Sanatorium. At rate of £150 and £100 respectively.
Hospital for Sick Children, Great Ormond-street, W.C.—H.P. and H.S. Each at rate of £100. Also Res. M.O. for Country Branch Hospital, Tadworth, Surrey. At rate of £250.
Hull Royal Infirmary.—Cas. H.S. At rate of £130.
Kensington, Fulham, and Chelsea General Hospital, 194, Finborough-road, Earl's Court, S.W.—Res. M.O. At rate of £100.
London Lock Hospital, 91, Dean-street, W.—H.S. At rate of £200.
London School of Hygiene and Tropical Medicine, Malet-street, W.C.—Lecturer in Applied Physiology. £475.
Manchester Northern Hospital for Women, &c., Park-place, Cheetham Hill-road.—Sen. H.S. £130. Also Jun. H.S. £100.
Manchester Royal Infirmary.—Director of Lab. for Clinical Investigation. £600. Also Asst. Res. Surg. O. At rate of £150.
Metropolitan Hospital, Kingsland-road, E.—Asst. Surg.
Miller General Hospital for South-East London, Greenwich-road, S.E.—H.P. and H.S. Each at rate of £125.
National Hospital, Queen-square, W.C.—H.P. £150.
Nottingham and Midland [illegible] £200.
Poplar Hospital for Accide[illegible]
Prince of Wales's General [illegible] Hon. Anæsthetist. £20. Also Hon. Clin. Assts.
Prison Medical Service.—M.O. (Class II.). £350.
Queen Mary's Hospital for the East End, Stratford, E.—H.S. and Obstet. H.S. Each at rate of £120.
Redruth, Cornwall, West Cornwall Miners' and Women's Hospital. Radiographer.
Rochester, St. Bartholomew's Hospital.—Res. Surg. O. At rate of £225.
Royal Waterloo Hospital for Children, &c., Waterloo-road, S.E.—Pathologist. £250.
St. Albans and Mid-Herts Hospital and Dispensary.—Res. H.S. £150.
St. Bartholomew's Hospital, E.C.—Asst. Surg. to Throat Dept.
St. Mary (Islington) Infirmary, Highgate Hill, N.—Asst. M.O. At rate of £350.
St. Marylebone Hospital, Ladbroke-grove, W.—Third Asst. M.O. £300.
St. Peter's Hospital for Stone, &c., Henrietta-street, Covent Garden, W.C.—Clin. Assts.
Salisbury, General Infirmary.—Pathologist. £1000.
Shanghai Municipal Public Health Dept.—Asst. Radiologist. Also Asst. Pathologist. 700 and 650 taels per month respectively.
Sheffield, Royal Infirmary.—Jun. Aural and Ophthalmic H.S. At rate of £80.
Sheffield University.—Sen. Demonstratorship in Anatomy. £400.
Southampton, Free Eye Hospital.—H.S. £150.
South-Eastern Hospital for Children, Sydenham.—Hon. Asst. Phys.
South London Hospital for Women, South Side, Clapham Common, S.W.—Clin. Assts.
Surrey County Council, Kingston-upon-Thames.—Asst. M.O. £800.
Taunton and Somerset Hospital.—Jun. House M.O. At rate of £100.
University College Hospital, Gower-street, W.C.—Ophth. Reg. £50.
West London Hospital, Hammersmith-road, W.—H.P., H.S. Also Aural and Ophth H.S. Each at rate of £100.
York County Hospital.—H.P. £150.

Births, Marriages, and Deaths.

BIRTHS.

HECKELS.—On Nov. 18th, at Ashley-road, Epsom, the wife of Graham W. Heckels, M.B., B.S. Lond., of a daughter.

MARRIAGES.

ATKINSON—HUNTER.—On Nov. 15th, at Victoria-road, Queen's Park, Glasgow, Surgeon-Captain Edward Leicester Atkinson, D.S.O., A.M., F.R.C.S., to Mary Flint, only daughter of the late Mr. and Mrs. John Hunter, Queen's Park, Glasgow.
MACPHERSON—CLAYDON.—On Oct. 22nd, at Lahore, India, Norman Stewart Macpherson, F.R.C.S., to Thelma, fifth daughter of Canon and Mrs. Claydon, Sydney, N.S.W.

DEATHS.

BARNARD.—On Nov. 17th, John Henry Barnard, O.B.E., M.D., M.R.C.S., aged 75.
COKER.—On Nov. 16th, at Chamberlain-street, Wells, Somerset, Owen Cole Coker, L.R.C.P. Lond., late of Uxbridge-road, W., and of The Towers, Bigbury-on-Sea.
DASHWOOD.—On Nov. 14th, at, Rodney-road, S.E., Charles Ewart Dashwood, M.R.C.S., L.R.C.P., late of Taormina, Sicily, aged 58.
NOAD.—On Nov. 14th, at Hove, Ernest Noad, M.R.C.S. Eng., L.R.C.P. Edin.
RACKHAM.—On Nov. 15th, at North Elmham, Norfolk, Arthur Richard Rackham, M.R.C.S., L.R.C.P.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

DISEASES OF THE EYE IN RELATION TO GENERAL MEDICINE.*

BY GLADYS M. WAUCHOPE, M.D., M.R.C.P. LOND.,
ASSISTANT PHYSICIAN TO THE NEW SUSSEX HOSPITAL FOR WOMEN AND CHILDREN, BRIGHTON.

Oculi indices animi sunt.—That the eyes are the informers of the mind is true in medicine both of what we see with our own eyes and of what we observe in our patients' eyes. To begin with, we learn much from the way in which the patient looks at us. A shifting nervous eye may put us on the track of some mental trouble aggravating or indeed causing symptoms. Exophthalmos, squints, unequal or unusually small pupils may be valuable indications. The general appearance of the eye is often characteristic—for instance, the almond-shaped eyes of Mongolian idiocy and the half-closed eyes of tuberculous meningitis—while a large, bright eye with a good deal of the white showing is associated with hysteria.

The eye may hoist a danger-signal that brings a patient to his doctor. A healthy person suddenly "sees double." This may indicate a central lesion and be the first symptom of encephalitis lethargica, tabes dorsalis, or disseminated sclerosis, or the double vision may be due to a peripheral lesion and may indicate basal meningitis, meningo-vascular syphilis, neuritis due to poisons such as lead and alcohol, or endogenous toxic conditions such as diabetes, where the sixth nerve is particularly liable to be affected. (Maitland Ramsay.)

Sudden loss or defect of vision is another alarming symptom and may lead to the discovery of various conditions, many of them purely local, while others are the visible signs of a general disease. Among the latter are: 1. Retinitis, diabetic or albuminuric. 2. Retinal hæmorrhages, associated with advanced arterio-sclerosis. 3. Embolus of the central artery of the retina or thrombosis of the vein leads to the loss of sight in one eye, and may be associated with heart disease, syphilis, arterio-sclerosis, &c. 4. Papillœdema due to intracranial tumour, especially of the pituitary, when bitemporal hemianopia is also present. 5. Optic neuritis and optic atrophy, in tabes and general paralysis of the insane, and occasionally in disseminated sclerosis and acute myelitis. 6. Toxic amblyopia, an interstitial neuritis of the optic nerve brought on by the excessive consumption of tobacco and alcohol. 7. Endogenous toxic amblyopia or amaurosis, diabetic or uræmic; uræmia, indeed, is said to be the most common cause of sudden blindness. 8. Night-blindness, which may be an early symptom of adult scurvy. 9. Hysteria, where the eye itself is normal.

The Eye in Diagnosis.

The eye may be a "sign-post" pointing to an otherwise doubtful conclusion: 1. A coincident iritis in a case of multiple arthritis incriminates the gonococcus. 2. Interstitial keratitis in the absence of typical (or any) teeth indicates congenital syphilis. 3. Unequal or fixed and contracted pupils in a case of mental derangement point to general paralysis of the insane. 4. "The glittering eye" of early Graves's disease suggests the diagnosis, before exophthalmos or other definite signs appear. 5. A hæmorrhage into the orbit may suggest scurvy. 6. Exophthalmos in a child with an obscure abdominal tumour indicates Hutchison's renal sarcoma (neuroblastoma). 7. Exophthalmos may point to chloroma and lead to the discovery of leukæmia. 8. The greenish corneal pigment identifies progressive lenticular degeneration. 9. How often does the general practitioner look at weepy red eyes and say "I think this child is sickening for measles"? 10. Œdema of the eyelids may occur in chronic arsenical poisoning.

In other diagnostic problems the eyes may give the "casting vote": 1. Examination of the optic disc may decide between cerebral tumour and meningitis. 2. Nystagmus establishes a diagnosis of disseminated sclerosis and puts hysteria out of court. 3. A tuberculous nodule in the choroid distinguishes the two common forms of meningitis in children. 4. Arygll Robertson pupils decide for tabes against a pure spinal cord lesion.

In the localisation of the site of a lesion the eye may be invaluable. Hemianopia places the lesion in a particular part of the optic tract; pin-point pupils indicate the pons; dilatation of one pupil shows that there is irritation of the cervical sympathetic. Loewy's midriatic test for pancreatic insufficiency depends on pupil reactions.

* A paper read before the Medical Women's International Association at Bologna.

The Eye in Prognosis.

Hippocrates, in the work entitled Prognostikon, described the "hollow eyes" ὀφθαλμοὶ κοῖλοι as part of the Hippocratic facies which we still recognise with dismay. Examination of the fundus is particularly useful in determining the outlook. In some conditions—e.g., tuberculous choroiditis—diagnosis is prognosis. The presence of retinitis in renal disease or diabetes makes the outlook grave, though I have seen diabetic retinitis improve and sight return with insulin. In hyperpiesis the presence of early arterio-sclerosis, making the prognosis less hopeful, can be detected in the vessels of the fundus, which become irregular in calibre and cross one another at right angles.

The Eye in Disease.

The eye is seldom the "fons et origo mali," for it is well protected from infection and is shut off, as it were, in its own cavity. Occasionally, however, infection of the orbit, usually after injury, spreads to the meninges and more rarely leads to septicæmia. Errors of refraction may cause headaches, insomnia, lack of concentration, and other symptoms of neurasthenia, and are said to be sometimes the cause of migraine. On the other hand, the eye may be affected in certain general infections; syphilis, gonorrhœa, and tuberculosis sometimes cause iritis, irido-cyclitis, and choroiditis, and uveitis may also arise as a result of nasal, oral, genito-urinary, or other so-called "focal infections." Conjunctivitis occurs in influenza, diphtheria, measles, and small-pox, and in cerebro-spinal fever it may be purulent and associated with neuritis of the fifth nerve. Herpes of the cornea is found occasionally in infections of the respiratory tract, from the common cold to pneumonia, and also in whooping-cough and typhoid fever.

The eye also takes part in various non-infective general diseases—e.g.: 1. The hemianopia of migraine. 2. The visual aura of epilepsy. 3. The rotatory and convergent nystagmus associated with spasmus nutans in children. 4. The yellow conjunctivæ and the xanthelasmata which occur in obstructive jaundice. 5. The lacrymation, aching of the eyes, and photophobia of hay-fever. 6. Blindness or disturbance of vision is sometimes part of a "stroke."

Glaucoma is a localised condition which simulates a general disease; it often begins with headache and vomiting, symptoms which may be attributed to a gastric disorder, a "bilious attack," renal or cerebral conditions.

Certain characteristics of the eye have been associated with the preponderance of one or other of the endocrine secretions. The "thyroid and adrenal eye" is prominent, active, with a large pupil, while the "pituitary eye" is deep-set in a massive orbit with overhanging ridges and the eyeballs wide apart. (J. Geikie Cobb.)

Keratomalacia is associated with deficiency of vitamin A.

Inheritance.

Cataract is a well-known hereditary and familial condition both when congenital and when appearing later in life; the inheritance is direct and not sex-linked. I have a patient, a woman with bilateral congenital cataract, whose maternal grandfather, mother, uncle, and aunt were all affected; the ordinary senile cataract also tends to run in families. In myotonia atrophica (dystrophia myotonica), not only is early cataract found in a large proportion of patients, but also in otherwise healthy members of the family; moreover, senile cataract is common in preceding generations, and appears to come on at earlier ages in each succeeding generation, until it is associated with an outbreak of myotonia atrophica in several descendants from a common ancestor. (Adie, W. J.: Proc. Roy. Soc. Med., Neurol. Section, 1923, xvi., 36.)

Blue sclerotics is another hereditary condition of the eye associated with a general disease—viz., fragilitas ossium. Five generations in a family have been known to have blue sclerotics (H. R. Swanzy), and although brittle bones sometimes occur alone, the association of the two conditions is striking.

Many other conditions—e.g., albinism, retinitis pigmentosa, and coloboma—appear to be directly transmitted. Amaurotic family idiocy is almost confined to the Jewish race, and as many as five children in a family of seven have been affected (Swanzy). Colour-blindness and Leber's disease, a hereditary optic neuritis or atrophy, are like hæmophilia in that they affect males only and are transmitted by unaffected females.

In these ways and in many others which I have neither the time nor the knowledge to put before you, does a study of the eye help us to "discover Nature's secrets."

ROYAL NORTHERN GROUP OF HOSPITALS. — A festival dinner will be held at the Savoy Hotel, Strand, on Dec. 5th at 7.30 P.M. Lord Northampton will preside, and Lord Bearsted will be among the guests.

A TUDOR ACT OF INDEMNITY FOR UNQUALIFIED PRACTICE.

Mr. M. Teichman-Derville, Mayor of New Romney, sends us a copy of a proclamation of Henry VIII., relative to the Fellowship of the College of Surgeons at that time, which he has discovered among the ancient records of the corporation. It has been lying with many other records—dating from about A.D. 1380 onwards—in the Muniment Room at the New Romney Town Hall, and is in a very good state of preservation. The exact wording is not clear in two small places where the document has been torn, and these imperfections are marked in the copy.

An ACT that PERSONS, beinge no COMMON SURGIONS, may MINISTER OUTWARDE MEDICINES.

Where in the Parliament holden at Westmynster in the iii yere of the Kynge's moste gracious reigne, amongest othere thynges, for the advoiding of sorceries, witchecraft, and other inconveniences, it was enacted that no person within the citie of London nor within vii miles of the same, shulde take upon hym to exercise and occupie as phisition or surgion, except he be fyrst examined approved and admitted by the bysshop of London, and others, under and upon certeyne peynes and penalties in the same act mentioned.

Sithens the makynge of which sayde acte, the company and felowship of surgions of London, minding onely theire owne lucres, and nothyng the profyte or ease of the diseased or patient, have sued, troubled and vexed divers honest persons, as well men as women, whom god hath endued with the knowledge of the nature, kynde and operation of certeyne herbes, rootes and waters, a[illegible] * of them to such as ben peyned with [illegible] as women's † sore, a pin, and the [illegible]mes of handes, scaldinges, burninges, sore mouthes, stone strangury, saucelim, and morfew, and such other like diseases: and yet the sayd persons have not taken anythynge for theyr peynes, or cunninge, but have ministered the same to the poore people onely for neyghbourhood and goddes sake, and of pitie and charitie.

And it is nowe well knowen, that the surgions admitted, wyll do no cure to any persone, but where they shall knowe to be rewarded with a greatter summe or rewarde than the cure extendeth unto, for in case they woulde minister theyr cunninge to sore people unrewarded, there shulde not so many rotte and perishe to death for lacke of helpe of surgery as dayly do: but the greatteste parte of the persones of the sayde crafte of surgions have small cunninge, yet they wyl take great summes of money, and do lyttle therefore, and by reason thereof, they do often tymes empaire and hurt theyr pacientes, rather than do them good.

In consideration wherof, and for the ease, comfort, succour, helpe, reliefe, and helthe of the Kynge's poore subjectes, inhabitauntes of this his realme, nowe peyned or diseased, or that hereafter shalbe peyned or diseased, be it ordeyned establyshed, and enacted by the authority of this present parliament, that at all times from hensforthe, it shall be lefull to every person beynge the Kynge's subjecte, havynge knowledge and experience of the nature of herbes, rootes and waters, or of the operation of the same, by speculation or practise, within any parte of the realme of Englande, or within any other the Kynge's Dominions, to practise use, and minister in and to any outward sore, uncome, wounde, apostemations, outwarde swellynge, or disease, any herbe or herbes, oyntment, bathes, pultes and emplasters, accordyng to theyr cunninge, experience and knowledge in any of the diseases, sores and maladies before sayde, and all other like to the same, or drinkes for the stone strangury, or a[illegible] without suche vexation, trouble, penaltie or losse of theyr [illegible] statute in the foresayde iii yere of the K[illegible]eigne, or any other acte, ordinaunce, or [illegible]y herof hertofore made in any wise not [illegible]

GOD SAVE THE KING.

Thos. Berthelet regis impressor excutit cum privilegio ad imprimendum solum.

Sir Arnold Lawson, who has seen the proclamation, writes: "There is no doubt of its authenticity. The document was among a bundle of old proclamations dating from the reign of Henry VIII. It is obvious that, at this time, the King had an extremely poor opinion of our profession and its morality; it is instructive to learn that a high dignitary of the church was required to act as Chairman of the Court of Examiners. From time immemorial the medical profession has been waging ceaseless war with 'quacks.' Evidently when this proclamation was issued the 'quacks' were getting a bit of their own back, and were scoring freely over their 'learned' opponents.

"The diseases mentioned in the proclamation are interesting from two points of view—

"(1) Why, besides denouncing in general terms the methods and customs of qualified practitioners, was attention drawn to a specified list of diseases and to 'all others like to the same'; because the herbalists certainly did not limit their attention to any class of disease, and everything was a fish which came into their net; and

"(2) What diseases are indicated by the terms (*a*) 'Pin,' (*b*) 'Saucelim,' and (*c*) 'Morfew.' A 'Webbe in the Eye' must, I think, point to cataract, though I have been under the impression that this disease was known generally as cataract long before the time of Henry VIII."

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* Part of word indecipherable. † Word obliterated.

RESEARCH IN MENTAL DISEASE.

THE annual report of the Joint Board of Research for Mental Diseases of the city and University of Birmingham records a great deal of routine work—3861 specimens in all—and 45 autopsies, as well as the continuation and elaboration of the research of past years. The investigation of the fat-lipoid-cholesterol ratios in adrenals and gonads is ready for publication, and further experiments on basal metabolism have been carried out. A special technique has been developed for investigating the bacteriology of the nasal sinuses, and an attempt has been made to correlate endocrine disturbances with septic conditions in the region of the pituitary gland. One case clearly showed the passage of organisms from the sinus membrane into bone, dura mater, and pituitary. The permeability quotient has been investigated with reference to changes which might follow non-protein and arsenical therapy in general paralysis.

A NEW POCKET HEAD LAMP.

THE Holborn Surgical Instrument Company, Ltd., 26, Thavies-inn, Holborn-circus, London, W.C., have placed on the market a new pocket head lamp which is contained, complete with battery, when not in use, in a little leatherette case measuring 5¼ × 3 × 1½ inches. In use the special filament lamp is connected to the battery by a length of flex, a lens cap concentrating the light on one spot. The lamp is fitted to an elastic head band, and the apparatus makes a very compact and convenient means for examination purposes. The lamp is switched on and off by means of the ball and spring contact by which it is hinged to the forehead piece. The price of the apparatus is moderate, and spare lamps and batteries can easily be obtained.

CONCENTRATED DIPHTHERIA ANTITOXIN.

British Drug Houses, Ltd. (16–30, Graham-street, City-road, London, N.1.) are now prepared to supply a super-concentrated and refined diphtheria antitoxin (D.S.I.) containing 2500 Ehrlich units per c.cm. with a protein content not exceeding that of natural serum. This enhanced therapeutic action has therefore been obtained without any increased risk of serum sickness, and without impairment of the reaction velocity of the antitoxin. The D.S.I. brand contains two and a half to five times the number of antitoxin units contained in an equal volume of ordinary natural serum. Its use is recommended in cases of diphtheria where time is of vital importance. It is supplied in rubber-capped phials containing 10,000 or 20,000 units. Kept in a cool and dark place, the serum is believed to retain its antitoxic potency for at least two years.

THE RADIOGRAPHER'S PONS ASINORUM.

Dr. W. Cotton, who has written extensively on X ray technique, sends us a reprint of a paper which he read at the recent Congress of Radiology at Stockholm. In this paper he dealt pictorially with perspective in relation to X ray interpretation, and emphasised particularly what he describes as the "pons asinorum radiographicus." Starting from the axiom that perspective deals with correct picture-making and viewing by straight lines radiating through the "original station point" (OSP), including images formed on any picture plane (PP) by X rays, photograph or drawing, he remarks that in radiography the OSP is the centre of emission of the focus tube and the only proper centre for the interpreter's eye, looking towards the objects portrayed. The pons asinorum he states thus: (1) The remote side of the PP is not a picture from their remote side of the parts depicted. (2) The remote side of any picture is a picture of the parts reversed as in a plane mirror. (3) A fluorescent screen in action is not a transparent window pane, but only a translucent window-blind viewed from the street, with the contents of a locked antechamber shadowed thereon from the keyhole.

MICROSCOPES.

THE sectional catalogue (List E 7) issued by Messrs. Reichert (Vienna) describes very fully the range of instruments and accessories manufactured by them. The microscopes range from low-power dissecting magnifiers of various types to large binocular instruments and specialised forms for mineralogical and biological work. Sectional diagrams illustrate the optical and mechanical details of many of the instruments, and tables are given showing the magnification produced by various combinations of objective and eyepiece. In the photomicrographic section weight and bulk have been economised to a high degree without sacrifice of the essential rigidity. Several of the cameras shown can be adjusted for copying, slide-making, and photographing small objects without the use of the microscope. The advance in lightness and adjustability is to be seen in the epidiascope described, which is smaller than many of the standard forms and can, amongst its other adjustments, be used to project a cinema film.

PRESERVATIVES IN FOOD.

THE International Office of Public Hygiene at Paris has sent out a questionaire to all countries relating to the preservatives and colouring matter in food permitted for home use, for export, and for those at sea. Replies received from the Polish Republic and from Japan have been published as a supplement to the monthly *Bulletin* for August issued by the International Office. In regard to Poland the replies are no longer valid, since in July, 1928, a new law came into effect based on the practice of the Austrian and Prussian provinces. In Japan the only legal preservative is salicylic acid, which is allowed in "saké," the national beverage, to the amount of 208 mgm. per litre. The tolerated amounts of preservatives seem generally to be higher in our own country than in the other countries mentioned. On the other hand, we treat the whole world alike; the regulations made by the Minister of Health appear to apply to all articles manufactured for sale or sold, whatever their destination. The Japanese restrictions also apply to all alimentary products which are manufactured in Japan, whether they are destined for consumption in the country itself or for exportation. Poland specifically excluded from the restrictions "alimentary products destined to be exported or employed as provisions aboard ships." It is difficult to gather whether this exemption was due to a disregard for the welfare of the seafaring man and the foreigner or to a deliberate choice of the supposed lesser of two evils on a long voyage—preservatives or putridity. It may be significant that the two island States, England and Japan, apply the same restrictions to foods for the sailor as to those for the landsman. Even in these days of hustle on the sea the crew of a tramp steamer get limited opportunities of enjoying fresh food.

THE FEEDING OF YOUNG CHILDREN.

THE object of a little book[1] which reaches us from America is to help those who have the task of arranging meals for children between the ages of 2 and 6 to observe a just balance between the various food elements, and to ensure the use of a dietary which may be relied upon to produce normal development. Menus are supplied for every month in the year, to be used as a working basis for family meals, and a whole section is devoted to preparation and cooking of food with recipes embodying the articles recommended. The book bears evidence of its nationality, and some modification will be needed in this country. The prudent English mother would hesitate to include fresh peaches and pineapples in the daily fare, and "white squash," "cambric tea," and "pettijohn" must convey more to the American than to the English public. These, however, are details, and the conscientious housewife will be grateful to find in the pages of this volume much thinking and planning done for her, and will welcome Dr. Richard M. Smith's assurance in his foreword that "any mother can safely use this book and be reasonably sure that her child's requirements in quantity and kind of food will be adequately met." Appendices contain lists of foods according to their vitamin content, and their protein and mineral relation to caloric values.

[1] Feeding the Child from Two to Six. By Mary Frances Hartley Barnes. New York: The Macmillan Company. 1928. Pp. 206. 10s. 6d.

GIFT FOR THE PURCHASE OF RADIUM.—The patient of a member of the staff of St. Bartholomew's Hospital, who has been successfully treated with radium, has given £14,000 anonymously to the hospital towards the extension of facilities for this treatment. The money will be used to purchase more radium and to instal an emanation plant.

TUNBRIDGE WELLS WATER-SUPPLY.—Tunbridge Wells Corporation is seeking Parliamentary powers to purchase compulsorily about 805 acres of land between Matfield Green and Pembury with a view of securing control of the town's chief source of water-supply. A sum of £70,000 is involved in the scheme, and the proposal was accepted by the corporation without any discussion.

NEW HOSPITAL AT ILFORD.—The Lord Mayor of London and the chairman of the London County Council [illegible] money for the erection of the King George [illegible] serve the rapidly growing population [illegible] area which includes the Council's Becontree housing estate. It is hoped that the Ilford Emergency Hospital may form the nucleus for a voluntary general hospital of 300 or 400 beds. King Edward's Fund have promised a first contribution of £10,000 provided that at least as much is forthcoming from other sources. The County Council is providing a similar sum.

An Address
ON
CHRONIC SPASMODIC AFFECTIONS OF THE COLON
AND THE DISEASES WHICH THEY SIMULATE.

Delivered before the Sheffield Medical Society on Nov. 29th, 1928,

BY JOHN A. RYLE, M.D., F.R.C.P. LOND.,
ASSISTANT PHYSICIAN TO GUY'S HOSPITAL.

OF the problems which confront the physician and the surgeon few are more troublesome than those which require the interpretation of chronic or recurring abdominal pain. Frequently the diagnosis must be attempted in the absence of any conspicuous objective sign, and, with symptoms for guidance, a decision must be made between "organic" and "functional," or, what is more serious for the patient and more exacting in clinical judgment, between a surgical and medical plan of relief. Modern investigations do not always provide the clue. Discussions which serve, in however small a degree, to illuminate this dark field of diagnosis are therefore to be encouraged, and we should be very ready to share our observations and our difficulties.

However great the triumphs of surgery may be in the acute abdominal catastrophes and in certain forms of chronic abdominal disease, none of us can feel content with the present position of abdominal surgery as a whole. We still see too many scarred abdomens with persistence of symptoms, too many "re-operations" and operations undertaken for pain, and it is disturbing to reflect upon the hours which must be lost annually to surgeons and their patients in the conduct of unrewarded appendicectomies, a considerable proportion of which have doubtless been advised by physicians. I would suggest that our shortcomings are less in respect of technique than of diagnosis, employing the term in its fullest sense of "thorough knowledge" of our cases.

Such remarks as I shall have to make are to be regarded as a slender contribution to the study of a not uncommon abdominal disorder which is characterised by frequent and prolonged discomfort, or troublesome and even severe pain; which is unassociated with any demonstrable organic change in the abdominal viscera; which sometimes simulates important organic disease; and for which consequently operations and explorations are performed.

The condition is variously referred to in the literature as *spastic constipation, chronic colospasm, spastic colon,* and *tonic hardening of the colon.* For convenience I shall refer to it as *spastic colon.*

HISTORICAL.

In Chapter IV. of his "Constipation and Allied Intestinal Disorders" Hurst [1] gives a useful bibliography of the subject and a concise account of the ætiology and important clinical features of the malady. It was first described by John Howship,[2] surgeon to St. George's Infirmary, London, in 1830, in a small and very readable book entitled "Practical Remarks on the Discrimination and Successful Treatment of Spasmodic Stricture in the Colon considered as an occasional cause of Habitual Confinement of the Bowels." He recognised that the complaint was due to "a deficient freedom of relaxation in some part of the intestinal canal," and both as a diagnostic test and a therapeutic measure advocated gradual distension of the bowel with a large warm gruel enema. Cherchewsky,[3] who was unfamiliar with this account, redescribed the condition in 1883. Fleiner [4] wrote his first article on spastic constipation in 1893. In this country Hawkins [5] wrote an admirably descriptive paper based on the study of 35 cases of enterospasm in 1906, drawing particular attention to the frequent confusion of the disease with appendicitis. The subject has hitherto attracted more attention on the continent, but latterly there has been a revival of interest in England. Turner,[6] from the surgeon's point of view, furnished an article to the Guy's Hospital Reports in 1924. Dr. G. Evans made it the subject of a communication to the Association of Physicians of Great Britain and Ireland in the present year. Stacey Wilson,[7 8] who had previously discussed the physiology of the pain in this disorder, has recently summarised his own views and wide experience in a book entitled "Tonic Hardening of the Colon." In this he discusses clinical features and advances his own therapeutic beliefs, but attributes, in my opinion, too long a list of physical and mental disturbances to the direct agency of tonic hardening.

THE CLINICAL PICTURE OF SPASTIC COLON.

The descriptions which follow are based on an analysis of 50 cases interrogated and examined by myself. The series includes 39 cases of spastic colon unaccompanied by mucus excess in the stools and 11 cases of the condition usually called muco-membranous colitis, or, better, mucous colic or muco-membranous colic, for cytological examination of the stools and the sigmoidoscope reveal no signs of ulceration and little or no evidence of active inflammation of the mucosa. The cases were taken from my file consecutively and with no special selection, excepting that those in which there was an element of doubt or obvious coincidental disease were excluded. The proportion of "spastic colon" cases to cases of "mucous colic" is, I believe, representative. The more detailed consideration of ætiology, symptoms, and physical signs is preceded by an account of an individual case portraying the more important features.

CASE 1.—A middle-aged professional man, of lean type and nervous constitution and liable to migraine, first started to have right-sided abdominal pain some 16 years ago. At one time and another cholecystitis and appendicitis were diagnosed, and finally, after careful investigation, the appendix was removed. He still, however, has the right-sided pain, and at times can feel for himself a sausage-like lump in the right flank. The attacks arrive especially in spring and autumn, and are precipitated by cold, fatigue, and mental worry. In a hot bath the pain is eased and the tumour fades away. The patient and his brother are both unable to face a cold east wind without developing abdominal pain. The pain shows a tendency to appear 2½ hours after a meal. Examination revealed general right-sided tenderness, and on one occasion the cæcum or ascending colon became vaguely palpable. The descending colon was felt like a firm cord, and occasionally the transverse colon was also felt. There were no other signs of disease. The patient found that a good open-air holiday with exercise and mental rest was best calculated to bring relief.

ÆTIOLOGY OF SPASTIC COLON.

Sex Incidence.—In the present series of 50 cases there were 17 males and 33 females. Excluding the cases with mucous colic which, with rare exceptions, are confined to the female sex, there were 16 males and 23 females.

Age Incidence.—The youngest patient was aged 19, the oldest 78. The average age was 39.

Physical and Psychological Types.—Nineteen cases were specifically described in my notes as "lean," "thin," or "spare." "Wiry," "dark," "tall," and "pale" were other adjectives which occurred with conspicuous frequency. Twenty-seven cases were recorded as nervous, neurotic, worrying, or anxious. Migraine and asthma were entered against the patient or an immediate relative with sufficient frequency to suggest a more than coincidental association. The association with asthma is commented upon by Hawkins.[5]

Family History.—In addition to these associations and general references to "nervous stock," there were two examples in my series of two brothers both suffering from spastic colon.

The evidence for a constitutional or diathetic factor is thus fairly strong, and has, I think, usually been

remarked by those interested in the condition. Conversely I would suggest that it is extremely rare to meet with spastic colon in fair-haired, blue-eyed, healthy-complexioned types with placid dispositions or in robust individuals. In my own experience spastic colon is more common in private than in hospital practice. As Hawkins remarks, "Intestinal neuroses diminish in frequency as we descend the social scale."

Predisposing Illnesses and Intoxications.—Dysentery, as might be expected from the habit of irritability which it engenders in the bowel, may be followed by spastic colon, and this even for years after the active infection has subsided. Three cases occurred in my series. Hurst also refers to the influence of lead and tobacco, and to colonic spasm reflexly induced by gall-stones, ureteric calculus, or other irritative visceral lesions, or due to tabes dorsalis. It is very difficult to assess the part played by *tobacco*. I would suggest that it is rarely the sole or main factor. Most of my male patients were smokers, and four of them really excessive smokers. On the other hand, the majority of the women were non-smokers. Occasionally I have seen patients with spastic colon in association with other manifestations of tobacco excess, such as sweating, dizziness, and palpitation. Plumbism and such coincidental diseases as appendicitis, diverticulitis, gall-stones, and tabes were, so far as possible, excluded. The causal or contributory effect of *purgatives* must be given due prominence. Thirty of the cases were recorded as constipated, and of these the majority were taking laxatives or purgatives occasionally or habitually. It cannot be doubted that undue irritability of the neuro-muscular mechanism of the bowel is present in these cases, and that the majority of the popular purgatives, however mildly so, are irritants. Furthermore, not a few of the patients are well aware that their pain may be aggravated by brisk purgation.

Constipation.—How far constipation is to be regarded as a cause or a consequence of the spasm it is difficult to say, but, as already mentioned, it was present in 30 (60 per cent.) of the cases. Nevertheless it is important to recognise that pain and tonic hardening of the colon are consistent with regular and apparently normal bowel function. Attacks of "diarrhœa" are a constant feature in mucous colic. Diarrhœa, occasional or constant, was also recorded in seven cases of simple spastic colon. In some cases, both costive and otherwise, it is tempting to believe that a low grade colonic infection is at work, but we have no certain information on this point. The cases are not pyrexial.

Frequency of Previous Appendicectomy.

In 18 (36 per cent.) of my cases the appendix had been removed. In one of these it was removed during a laparotomy which I myself advised (vide Case 3). In only three instances was it specifically noted that the appendicectomy was undertaken for acute appendicitis. In several instances the operation was undertaken for relief of pain not dissimilar from that for which relief was again sought. In one case there had been two further explorations. In other cases a diagnosis of "chronic appendicitis" had been suggested.

The Patient's Symptoms.

The leading complaint is usually of discomfort or pain in the lower abdomen. The *discomforts* are variously described as a feeling of stagnation or "stoppage," as "a ball" or "a lump," or as a sensation "like a bar of lead"; the direction of this bar may actually correspond with some part of the large bowel, and the description is remarkable for the nicety with which it interprets the tonic rigidity present in the affected segment. The *pain* is usually a dull continuous ache, sometimes "gnawing" or "like a toothache," never rhythmical or griping as in the colic of purgation, acute enteritis, or intestinal obstruction, and even in the severe cases unlike the relentless, immobilising pain of an acute inflammatory lesion. It varies in severity from something quite trivial to an intensity—as will be described later—so severe as to simulate the major colic of a ureteric calculus, and to call for the administration of morphine. These severe cases are fortunately rare. Diagnosis even in the attack may be extremely difficult. In a case of average severity the pain is at times troublesome enough to interfere seriously with work or pleasure, although it is noteworthy that sleep is seldom lost on account of it. It is usually referred with accuracy to the part of the colon involved, and I must differ from Stacey Wilson [7 8] when he states that the distribution is segmental. A common gesture is the application of the palm of the right or left hand to the corresponding iliac fossa, when the proximal or distal portions are affected. In the case of the transverse colon the course of the pain is traced with a finger or shown with the ulnar border of the hand. For purposes of brevity I tabulated the cæcum and ascending colon as "first part"; the transverse colon as "second part"; and the colon from the splenic flexure to the commencement of the rectum as "third part." Of the cases in which observations of the part affected were noted the first part was indicated in 26, the second in 14, and the third in 21. Rectal pain was also recorded in a few cases. Some patients could only describe a vague lower abdominal "stomach-ache." Variations in the situation of the pain are spontaneously described. Associated pyloric spasm and, in women, bladder discomfort and frequency are not rare. "Dead fingers" are a common complaint. With the pain there is often mental depression or irritability and physical inertia. Both onset and relief may be abrupt and occur for no apparent reason. The duration of the pain varies from an hour or less to many hours or even days.

Of aggravating or precipitating factors I would particularly mention cold and fatigue, each of which were specifically recorded in 14 instances; jolting, such as results from games or digging, horse-riding or motoring over rough roads, and even walking; mental stress or worry; purgatives; tobacco; and, in women, the menstrual cycle. The more irritable cases of mucous colic are very susceptible to fruit. Patients are sometimes more, sometimes less, comfortable when their bowels are confined, but aggravation of pain immediately after the act of defæcation is common. Warmth, rest, hot baths, and open-air holidays with freedom from cares are among the relieving factors. Food sometimes gives temporary relief.

Physical Findings.

To these disturbed sensations certain objective information can be added in a high proportion of cases, more especially if the opportunities for examination are frequent. The physical sign of the disease is an unusual palpability of some part or parts of the colon; this depends upon tonic rigidity, shortening and straightening of the affected loop. The colon can often be felt in the left iliac fossa in healthy persons or in patients without colonic disease, and simple palpability in this region cannot be regarded as pathological. In spastic colon it is felt as an unduly hard cord of small calibre. It is doubtful if the colon is ever palpable in its proximal or transverse portions in perfect health. In the condition of spastic colon, however, either of these portions may be felt as a firm rod or sausage-like tumour. This is sometimes, but by no means always, tender. The degree of palpability varies from time to time, and even in the course of a single examination, and is more likely to be remarked when symptoms are present. In those cases in which undue palpability was noted in my series the first part was affected in 18 instances; the second part in 8, the third part in 9. The first and third parts were simultaneously felt in 3, and all three parts in 4 cases. What Stacey Wilson aptly likens to a "cartilaginous ring" may sometimes be felt on inserting the finger into the rectum. Occasionally attacks of ballooning of the cæcum are observed behind a spastic ascending colon.

The stools as a rule show nothing very characteristic excepting in the group to be separately considered under the heading of mucous colic. In the larger group there is no mucus excess or occasional very slight excess; no blood; and the colour varies within normal limits. There may, however, be fragmentation, and, in the presence of anal spasm, narrowing of the fæcal mass. If purgatives are being used the motions may, of course, be "loose," "messy," and unsatisfactory.

Sigmoidoscopy is often both difficult and painful on account of spastic narrowing of the rectal and sigmoid lumen which is further stimulated by passage of the instrument. Fluctuations in the degree of spasm can be witnessed simultaneously with variations in the pain complained of by the patient. The mucosa looks perfectly healthy.

Less is to be gleaned from *X ray examination* than might be supposed. In the first place, the spastic state is intermittent and may not coincide with the examination. In the second place, a barium enema, which is commonly used in preference to the barium meal in colonic cases, may by its gradual introduction and gentle distension overcome existing spasm, just as Howship was able to bring relief in painful spasm with a large gruel enema; in the third place, when views are taken after evacuation of the bulk of the meal or enema, it is necessary to distinguish the appearances of a normal but partly emptied segment from a segment with spastic narrowing of its lumen. Examination after a barium meal is more likely to give positive evidence. In extreme cases the affected length of bowel appears as a thin thread or streak of barium, sometimes with a sharp line of demarcation from the better filled portions (vide Figs. 1 and 2). Normal haustrations, deepened with lesser degrees of spasm, become obliterated when the spasm is very pronounced. In some cases the whole transverse or descending colon or a longer portion is involved; in others, but less frequently, the spasm is localised to an inch or two. The localised spasms cause a more intense pain. Two other departures from the normal are important and will be discussed later. These are shortening and straightening of the affected loop.

Mucous or Muco-membranous Colic (Muco-membranous Colitis).

I see no valid reason for placing these cases in a separate category. The abdominal pains described, the aggravating and relieving factors, and the radiographic appearances are identical. The chief differences are as follows: (1) the sex incidence, the cases being almost all in women; (2) the passage in attacks (usually after a period of constipation, chilling, anxiety, or fatigue) of large quantities of coagulated mucus, sometimes in casts or shreds or enveloping small scybalous fragments; (3) the more evident neurotic associations; (4) an exaggerated colonic tenderness with flinching and hyperalgesia but less definite palpability of the bowel. The sigmoidoscopic findings are as described in simple spastic colon. The mucosa is smooth and, at the most, slightly redder than normal.

Differential Diagnosis.

Judging by my own difficulties and those experienced by colleagues who have referred cases to me, the following conditions are among those which are simulated or suggested by the "spastic colon": (1) appendicitis, acute and chronic, (2) duodenal ulcer, (3) diverticulitis, (4) colonic carcinoma, (5) renal colic, (6) intestinal obstruction, (7) ovarian or tubal disease, (8) neurasthenia and hypochondriasis, (9) fæcal tumours. Finally (10) the cases with mucus excess seem not infrequently to conjure doubts about the possibility of ulcerative colitis, or have been vaguely classified as "colitis."

(1) *Appendicitis.*—In one of my cases the hard lump in the right iliac fossa formed by the contracted colon during an attack of pain had led a surgeon to a provisional diagnosis of appendicular abscess. More usually the persistence of symptoms leads to appendicectomy for a so-called "grumbling appendix." In simple spastic colon there is, as a rule, no pyrexia, guarding, vomiting, or cutaneous hyperalgesia. In acute exacerbations of mucous colic there may, however, be slight pyrexia, flinching (rather than guarding), superficial soreness, deep tenderness, and even sickness; but the previous history, the patient's psychology, and inspection of the stools generally establish the diagnosis. In simple spastic colon the interrogation, particularly in regard to the nature, duration, and localisation of the pain, and careful palpation along the course of the colon are usually adequate. (2) *Duodenal ulcer* may be simulated, firstly, because of associated pyloric or gastric spasm with food relief; and, secondly, because the colonic pain itself, although differently situated, may develop late after meals and be relieved by food. If there is any suspicion of duodenal ulcer as an alternative or additional diagnosis a full investigation should be advised. (3) *Diverticulitis.* In the left-sided cases particularly this possibility must be borne in mind, but the type of individual affected is usually different, the victim of diverticulitis being commonly well nourished and less commonly neuropathic. The inflammatory tenderness and thickening of pericolitis and pyrexia during exacerbations are distinctive. X ray examination after a barium enema should be made in case of doubt. (4) *Colonic carcinoma* has frequently been feared in cases of spastic colon because the patient himself or his physician has discovered a hard lump in the course of the colon. The smoothness of the tumour, its sausage or rod-like formation, its mobility in the case of the ascending or transverse colon, its variations in size and hardness, or complete disappearance under observation or in a hot bath are helpful points in differentiation. The absence of obstructive symptoms on the one hand, and of diarrhœa or passage of blood on the other, and generally a very long history of abdominal discomforts are reassuring features. If doubts persist the aid of the radiologist, sigmoidoscopy, and chemical and cytological examination of the stools should be invoked. (5) *Renal colic* is only likely to be simulated in the occasional cases with very severe pain (vide Case 3, in which the hardened colon was mistaken by myself and others for the left kidney). (6) *Intestinal obstruction* was feared in Case 4, in which the complication of cæcal distension was present. (7) *Ovarian or tubal disease.* At one time it was not uncommon for operations on one or both ovaries, but especially the left, to be performed for spastic colon. The fallacy probably arose from the aggravation of colonic pain which sometimes accompanies the period and from the association with dysmenorrhœa. (8) *Neurasthenia and hypochondriasis* may appear appropriate labels in some cases of spastic colon, but they do not embody an adequate explanation of the pain and physical findings. (9) *Fæcal accumulations* can be disposed of with enemata. (10) "*Colitis*" is an inaccurate pathology. I have had several cases of mucous colic referred to me with a diagnosis of *ulcerative colitis*, but the two conditions bear little resemblance to one another. In the more serious disease an ill and frequently anæmic and wasted patient gives a history of watery diarrhœa and passing blood and mucus, commonly with a febrile, dysenteric onset. The diagnosis is completed with the sigmoidoscope.

Frequency of Spastic Colon.

Taking all grades of the condition, allowing for its varied appellations and deceptions, and judging by information received from colleagues in general practice, I can only conclude that spastic colon is a common disorder. On the basis of consulting and hospital experience I should say that it ranks high among the causes of chronic abdominal distress. Numerically in my index it is more frequent than gastric ulcer, but less frequent than duodenal ulcer, conditions which are far more likely to be referred for a second opinion.

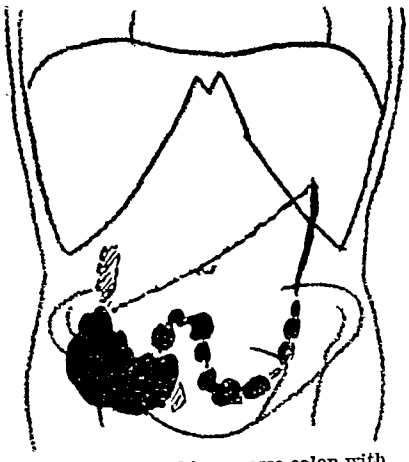
NATURE OF THE DISORDER.

"Spastic colon" falls into the category of the visceral neuroses. Its association with certain physical and psychological types; its intermittent behaviour; its aggravation by circumstances which depress or harass the higher centres; and the absence of all evidence of an associated organic lesion, give credence to this view. It is a close ally to bronchial asthma, in which an inherited irritability of the bronchial centres and a sensitiveness to certain local, psychic, and peripheral stimuli are, on Hurst's [9] showing, so apparent. Just as with asthma so with spastic colon cases occur in which spasm alone is the outstanding feature, and others in which mucorrhœa is superadded. Asthma is sometimes coincident with colonic spasm in the same patient or recorded in a near relative. The stimuli which may provoke and perpetuate an attack of colonic spasm include (1) local stimuli (purgatives, constipation), (2) central nervous stimuli (worry), (3) external peripheral stimuli (cold). The same irritability of plain muscle is often simultaneously manifest as bladder frequency and even bladder pain, especially in female sufferers from spastic colon; in pyloric spasm; spasmodic dysmenorrhœa; and in the vascular spasm which gives rise to "dead fingers."

NATURE OF THE SPASM AND PAIN.

In obstructive or irritative lesions of the colon there is increased peristaltic activity with more or less rhythmical griping due to the passage of waves of contraction involving successive groups of circular fibres. In spastic colon no such rhythmical movements are provoked, but the tonus or posture of the muscle-fibres, including the longitudinal fibres, is modified in such a way as to impart a sustained shortening, with rigidity and narrowing of the lumen, to portions of the bowel wall often many inches in extent. The hardness and equally the straightening and shortening of the affected loop cannot be otherwise explained. I was at one time puzzled by finding a hardened and horizontal transverse colon crossing the epigastrium, for although this is its anatomical situation I knew that the radiologist more frequently showed this structure as a festoon in the middle or lower abdominal planes and sometimes even in the true pelvis. Examination of Figs. 1 and 2, copied from radiograms in my possession, will show what remarkable straightening may occur and at once explains the clinical observation. Surgeons sometimes witness the phenomenon of tonic hardening in the course of a laparotomy when the affected loop becomes rigid, pale, and erect in the wound. I know no clinical condition which better supports the hypothesis that visceral pain originates in the viscus and is due to increased tension in the muscle-fibre than spastic colon. With no inflammatory disease to involve the other coats of the bowel or neighbouring tissues, and so to confuse the issue, it is possible to demonstrate in these cases at once a complete absence of somatic hyperalgesia and well-defined pain and tenderness in the affected bowel itself, a pain and tenderness which increase when the hardening increases and diminish when it diminishes. The sustained and aching character of the pain accords well with this durable modification of tonus or posture, and contrasts with the sharper, transient agony of peristaltic colic.

FIG. 1.

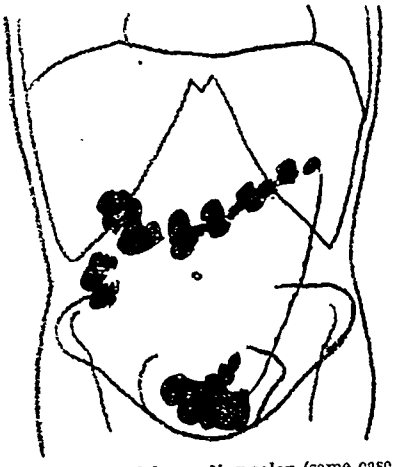


Tonic spasm of transverse colon with ballooning of cæcum (erect).

ILLUSTRATIVE CASES.

CASE 2.—*Illustrating the influence of cold, the simulation of appendicitis, and the cause of the pain.*—A young and athletic lady, aged 25, developed pain in the right iliac fossa on a long voyage. The ship's doctor diagnosed appendicitis, but would not operate on board. On arrival in England her own medical adviser and a surgeon saw her and concurred in the diagnosis, but freely admitted that the appendix when removed was "disappointing." The other organs were healthy. The pains recurred and she was brought to see me. I obtained an earlier history of *many attacks of sudden and intensely severe pain coming on ten minutes after a long swim*, in which she was doubled up, looked green and ill, but was relieved by brandy. Since the operation there had been a slight looseness of the bowels. She had noticed aggravation by fatigue, cold, and by fruit and green vegetables. During my examination I was able to demonstrate a hardening of the colon in the right iliac fossa which came and went, the pain coming with the "lump" and disappearing as it "faded." The diagnosis had been made easier for me by the negative operation findings, but the earlier history of precipitation by cold was instructive.

FIG. 2.



Tonic spasm of descending colon (same case as Fig. 1) twenty hours later (supine).

CASE 3.—*Illustrating difficulties in differential diagnosis, the occasional severity of the pain, and aggravation by an enema, jolting, &c.*—An infantry officer, aged 41, consulted me on Feb. 25th, 1926, for severe pain in the left subcostal region passing through to the back at the same level. He had also felt the pain in mid-epigastrium where he had been tender. He had suffered similar symptoms a year and also five months previously, but less severely. The pain was liable to come one or two hours after food, and was sometimes relieved by eating. Jolting definitely aggravated it. His actual sensations he likened to "a lump of dough stuck and swelling as though about to burst." He was lean, tense, and tremulous, and very tender in mid-epigastrium. I made a provisional diagnosis of gastric ulcer and put him into a nursing home for observation. On Feb. 27th he had a very severe attack of pain below the left rib margin and radiating down towards the groin. *The pain immediately followed an enema.* Morphine was given on more than one occasion. He was tender under the left ribs and I queried feeling the kidney. Jarring the loin also caused pain. Urine normal. His wife then remembered that for years he had had an occasional day in bed for left-sided pain. While I was away for a week-end, the patient, my deputy, and the nurses all noted the presence of a lump below the ribs which was gone on my return. I now decided to regard the symptoms as renal. A surgical colleague who saw him with me concurred, but cystoscopy and pyelography were negative. The pain continued, and he was explored on March 14th, all investigations having proved negative and all medical treatment unavailing. A slightly fibrotic appendix was removed, and adhesions between the duodenum and gall-bladder were freed. No ulcer, gall-stones, growth or other abnormality were demonstrable. He was not relieved of his symptoms by the operation, although reassured in his mind by the findings. I was then able to satisfy myself that both the pain and the lump were colonic and due to tonic contraction. I have seen only a few other cases in which the pain was so severe and none so deceptive in symptomatic associations. I saw this patient, who remains on duty, recently, and was able to feel the hardened colon to the left of the navel. He is quite clear that jolting and cold, which I had come in the

interval to recognise in other cases as important aggravating factors, are very definitely so in his case. I should clearly have paid more attention in his first bad attack to the influence of the enema.

CASE 4.—*Illustrating the occasional severity of symptoms, ballooning of the cæcum, the shortening and straightening of the colon, and the accuracy of localisation by the patient's gesture.*—I was consulted in May of the present year by a woman aged 40. From girlhood she had suffered from constipation and a liability to nausea, and had been prevented by her poor health from taking up work in which she was interested. In 1921 she had acute gangrenous appendicitis. Since then she had, in the words of her medical adviser, had three or four attacks "almost like a partial obstruction." These start with feelings of pain and weight in the cæcal region where a big bulge appears. In her last attack she could "feel the bowel like a lump," and was in pain for four or five hours continuously. The pain also passed straight across her abdomen to the left. Lesser attacks were brought on by work in the garden, and could be cut short by lying down. There was aggravation by purgatives and her pain was worse after defæcation. On palpation I was able to feel a hardened colon which again "faded" under my hand. The radiograms showed an extreme degree of colonic spasm affecting first the transverse and later the descending portion. During the examination she surprised the radiologist by *accurately tracing the course of the transverse colon by her sensations.* This straight course from hepatic to splenic flexure is well shown in Fig. 1.

TREATMENT.

Most patients with "spastic colon" have been walking in fear of organic disease; many of them have been told that they have organic disease; cancer-phobia is frequently present; operations may have been advised or already performed. The first duty of the physician is therefore full reassurance. With this must be combined a simple explanation as to the nature of the disorder and the mode of origin of the pain. Under general hygienic measures the importance of mental and physical relaxation, of holidays, of moderate exercise, of warmth, and a sensible mixed diet must be enumerated. Often the diet has been cut too low and fruit and vegetables have been too rigorously excluded. The bulky starchy foods, potatoes, beans, and peas, which predispose to intestinal flatulence, are better avoided, but fruits of all kinds, excepting those with tough skins and seeds, and the softer green vegetables should be liberally prescribed together with wholemeal bread and farm produce as a natural treatment of the costive tendency. Tobacco may require restriction or even be forbidden for a long test-period. Purgatives must be entirely forbidden, but lubricants may be given. Belladonna or hyoscyamus in full pharmacopœial doses helps to relax the spasm. Bromides should be reserved for the anxious and "jumpy" patients, and withheld in the case of the more jaded and depressed. There is commonly restlessness with a furrowed brow, and hypertonus of skeletal muscles. Psychotherapy plays an important part in the treatment of such cases. Jackson [10] has described a method of treatment by "progressive relaxation" in which clinical improvement is shown to coincide with a return to normal in the colonic radiograms and a diminution in the briskness of the knee-jerks. The good sleep enjoyed by most patients, even when suffering bad pain by day, is probably due to the relief afforded by natural muscular repose. In some cases the sallow complexion and lassitude and a furred tongue during the attacks seem to suggest an element of what—for want of a more precise term—we must continue to refer to as intestinal toxæmia. I think it must be in these cases especially that Stacey Wilson obtains his successes by exhibiting liquor hydrarg. perchlor. with liquor ferri perchlor. I have not tried his prescription extensively, but in one case it seemed to bring about a remarkable improvement when other remedies had failed and the patient was begging for an exploration. In cases with severe pain and in exacerbations of mucous colic, initial large warm enemata administered very slowly, both to give lavage and to overcome the spasm, and rectal injections of warm liquid paraffin (4 or 5 oz.) to be retained overnight, are useful. The disorder, being like asthma and migraine, so largely dependent on constitutional factors, is difficult to "cure," but repeated reassurances and rational treatment will often mitigate symptoms even in bad cases. In milder cases there may be complete relief.

CONCLUSION.

I have attempted a somewhat detailed analysis of the clinical picture of spastic colon because the diagnosis of the condition should generally be possible on clinical grounds. Furthermore in functional disorders of this kind special investigations inevitably give a high percentage of negative results. The recognition of spastic colon as an occasional cause of very severe abdominal pain and as a common cause of persisting or recurring pain in the right iliac fossa is, I believe, especially worthy of emphasis. Writing of these visceral neuroses in 1906 Hawkins said, "They are at this moment particularly worthy of study, owing to the advance of abdominal surgery, not because they are amenable to surgical treatment, but rather because they need protection." I think it should be accepted that they still need protection, and that for this and other reasons they are still worthy of study.

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THE RELATION OF ARTHRITIS OF THE SACRO-ILIAC JOINT TO SCIATICA,

WITH AN ANALYSIS OF 100 CASES.*

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THE part which the sacro-iliac joint plays in "lumbago" and "sciatica" has long been a source of speculation, and in America "sacro-iliac strain" or subluxation is a common diagnosis. My attention has been drawn to the apparent frequency of a spur or irregularity of bone at the lower end of the sacro-iliac joint, and the analysis of a number of cases may be of some value. The series consists of 100 cases admitted to the Royal Bath Hospital, Harrogate, with a diagnosis of sciatica, in all of which radiograms of the sacro-iliac and lumbo-sacral joints had been taken. In all radiograms the hip was included, and in most some or all of the lumbar vertebræ were shown.

Anatomy of the Joint.

In order to obtain a clear conception of the rôle which the sacro-iliac joint plays in the causation of sciatica it will be necessary to summarise briefly the anatomy of the joint and its relationship with the lumbo-sacral cord.

In addition to descriptions in standard text-books of anatomy, reports on a series of dissections of the joint have been made by Albee[1] and Brooke.[2] In 50 specimens Albee found a perfect joint with synovial membrane, cartilage, joint cavity, and well-formed capsule. The joints before being opened were injected with methylene-blue, which showed that the synovial membrane distended and retracted along the anterior inferior aspect of the joint during movement. The lumbo-sacral cord was found in close proximity to the lower third of the joint. Brooke based his findings on 200 dissections, and confirmed Albee's work. He found that many males in late middle and advanced

* Abstract of paper read before the Harrogate Medical Society.

life had ankylosed joints, and considered these to be senile pathological changes; no females showed ankylosis. He summarises by saying that the joint is diathrodial in type and probably takes part in movements backwards and forwards of the lumbar spine.

Danforth and Wilson[3] made exhaustive dissections of the lumbo-sacral cord, and found that the foramen between the fifth lumbar vertebræ and the sacrum was the smallest intervertebral foramen, yet the fifth lumbar nerve was the largest nerve. This significant fact seems to justify their conclusion that the lumbo-sacral cord is less likely to receive damage from the sacro-iliac joint because there is no canal, and therefore the chances of nerve injury are much greater in the lumbo-sacral region. The fifth lumbar nerve, however, lies in close proximity to the sacro-iliac joint and the first and second sacral nerves join it to form the lumbo-sacral cord at the lower margin of the joint, but are separated from it by the pyriformis muscle and its fascia of origin. Insufficient attention has been paid to the rôle of the pyriformis in the causation of sciatica; the muscle arises from the pedicles of the second, third, and fourth sacral vertebræ and adjacent part of the bone lateral to the sacral foramina. It is therefore in contact with the anterior ligament of the sacro-iliac joint and the roots of the first, second, and third sacral nerves, and its lower border is closely related to the whole trunk of the sciatic nerve. The pyriformis is an abductor and external rotator of the hip, and is a flexor of the hip in the act of walking.

It will be advantageous to consider briefly the segmental sensory distribution of the leg. The fourth lumbar nerve supplies the inner side of the leg from just below the knee to the ankle and inner side of the foot, the fifth lumbar the outer side of the leg and dorsum of the foot, the first sacral the sole of the foot, dorsum of the toes, outer side of foot, and some way up the back of the leg; the second sacral supplies a long strip stretching down the middle of the back of the thigh from the fold of the buttock to below the popliteal space. In addition, the gluteal muscles are supplied from the first and second sacral. Broadly speaking, pain is referred to the posterior aspect of the thigh as well as to any part of the lower leg, and to the inner aspect of the thigh in certain cases.

Résumé of Literature.

The literature on low back pain and sciatica reveals a difference of opinion as to the part taken by the sacro-iliac joint.

As reported in THE LANCET,[4] Lusskin and Sonnenschein[5] offer an explanation of how sacro-iliac sprain is brought about, and describe how the resulting symptoms of low back pain and pain shooting down the leg are relieved by strapping in acute cases and by an appropriate brace. On the other hand, Albee[1] who, 20 years ago, held similar views, now[6] considers these symptoms are due to "myofascitis," his own word to describe inflammation of muscles and fascia, apparently covered by the older word "fibrositis." He states that over 90 per cent. of cases of "lumbago," "sacro-iliac," "sciatica," &c., are examples of myofascitis, that the insertions of fascia and muscles into the bony structure of the sacro-iliac joint are tender, and that 90 per cent. of these patients have symptoms referable to the colon.

The literature of disease of the joint is not so profuse as that of joint strain, but Barré and Duprey[7] recognise "sacro-iliac sciatica," although they consider that sacro-iliac arthritis is usually tuberculous; they differentiate this syndrome from primary sciatica by the fact that in the former the buttock wastes before the leg and foot, and pressure on the nerve is painful. Gowers stated that when the disease is within the pelvis tenderness of the trunk of the nerve is slight in proportion to the pain. Against this evidence implicating the sacro-iliac joint is the opinion of almost as many observers who blame abnormalities of the lower lumbar vertebræ and lumbo-sacral joint for this type of sciatica. Putti[8] considers that the hypothesis lacks anatomical and clinical support. I hope to advance some clinical evidence to show that in certain cases there is a connexion between arthritis of the joint and sciatica.

Putti calls attention to anomalies in the plane of the articulations between the lumbar vertebræ and between the fifth lumbar and sacrum. To obtain radiological evidence in support of this necessitates numerous radiograms, and a stereoscopic view is almost essential. I have not felt justified in having this done, so that I have only two clear pictures of this anomaly.

The many views on the causation of sciatica have one item in common, a recognition of a lesion in the lumbar and sacral region, indicating a tendency to regard sciatica as a symptom and not a clinical entity, with attention focused on the roots of the nerve rather than on the trunk.

Clinical records are few, but Danforth and Wilson,[3] Doub[9] and Rogers[10] all report series of cases. Rogers[10] in 50 cases found lesions of the lower spine in 49, the remaining case being carcinoma of the prostate. He classifies 17 cases as acute strain of the lower spine, most of them representing an acute lesion of the sacro-iliac joints, 21 as chronic strain of the lower spine, 8 as hypertrophic arthritis of the lower lumbar spine confirmed by radiograms, and 4 as tuberculosis. Cone[11] has reported two cases which showed a "haziness" in the sacro-iliac area. They had received much treatment for a relaxed sacro-iliac joint, but were only relieved when a spicule of bone was removed from the great sciatic notch and the nerve freed from adhesions. Discussing the diagnosis of arthritis of the sacro-iliac joint on the evidence of bony overgrowth at its lower margin, Verrall[12] remarks that "inexperienced radiologists often report the presence of arthritis of this joint when none is present, basing their diagnosis on lipping of the joint margin at the lower end. This apparent lipping is due to a groove, in which a small vessel runs, which is bridged by a ligament described by Derry of Cairo and used by him as a sex indication in investigating the remains from certain pre-dynastic cemeteries in Nubia, the groove being better marked in the female, especially after many pregnancies or if congenital relaxation is present. However, skiagrams do show arthritis which is generally of the atrophic variety." The radiograms in my series have been re-examined by Dr. C. G. Hitchcock, and include two examples of the groove which Verrall describes. The report of one case is as follows (Fig. 1):—

Female, age 20, unmarried, stillroom maid. Pneumonia two months before admission. Pain in back started 14 days before the pneumonia. Catamenia regular but associated with constipation and painful defæcation. Tenderness over the sacrum down to the coccyx. Rectal examination showed acute tenderness over inside of pelvis, especially at lower margins of the sacro-iliac joints. X ray showed tilting of the lumbar spine to the left, due to old trauma or disease and well-developed bony spurs at the lower borders of the sacro-iliac joints.

One other picture showed a similar condition in a miner, aged 50, who had also marked spondylitis of the lumbar vertebræ.

Analysis of 100 Cases.

		Average age.	Youngest.	Oldest.
Men	77	44	18	72
Women	23			

Occupation.—The women were in no particular trades, the majority being married and in charge of homes. The occupations of the men were various; 25 were miners, and 72 per cent. were employed in occupations requiring much back movement—e.g., labourers, gardeners, engineers, &c. This suggests sustained back-effort as a predisposing cause.

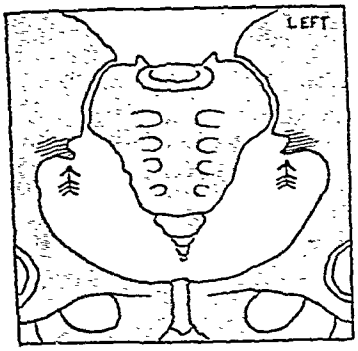
Classification of Lesions (100).

1. Arthritis of sacro-iliac joint alone	19	36
2. Ditto, and other lesions	17	
3. Abnormality in region of sacro-iliac joint	8	
4. Arthritis of hip alone	8	12
5. Ditto, and lesion of lumbar vertebræ	4	
6. Various lesions of lumbar vertebræ	20	
7. Normal appearance	24	

These figures require amplification. Arthritis of the sacro-iliac joint was diagnosed if the joint showed

a blurred outline or fusion of the articular surfaces or if there was erosion or osteophytic outgrowth at the lower border of the joint. (Fig. 2). In Group 2 the "other lesion" was spondylitis of the fourth and fifth lumbar vertebræ and, in one case, sacralisation of the fifth lumbar vertebræ; in four cases the hip showed evidence of arthritis. Group 3 was made up as follows: malignant disease of the prostate with secondary deposits in the ilium; a cystic tumour of the ischium; two cases of calcified glands in close relationship to the lower end of the joint; two cases of the marked artery-notch mentioned previously; one case where the sacrum was deep to the iliac crests; and one case showing a displacement of the left lateral mass of the sacrum, perhaps an example of the "sacro-iliac strain" of the American writers.

FIG. 1.



Tracing of radiogram showing well-marked grooves, as described by Verrall, on both sides.

The remaining groups have little bearing on the points raised in this paper, but only two cases showed abnormalities of the articular facets of the fifth lumbar and sacrum as described by Putti.

Ankylosis of the sacro-iliac joint was present in nine cases, all men, but the age-incidence was younger than in the cases described by Brooke; only four of mine were over 50, and the youngest was 22.

Arthritis of a joint which can be demonstrated by a radiogram is by no means in an early stage, so that the above findings are significant. Where a radiogram shows alteration there must be a large amount of inflammatory reaction in the adjacent soft tissues, a condition of periarthritis. It is justifiable to suppose that such a state of things occurs in the sacro-iliac joint. Where joint movement is so slight the condition is unlikely to cause symptoms until it is advanced, and may not be noticed until some extra strain or unusually sudden movement is made involving the muscles in the neighbourhood of the joint. Any lesion of the sacro-iliac joint may cause inflammatory reaction of the pyriformis muscle and its fascia. This fibrositis will involve the first and second sacral roots if not the whole trunk of the sciatic nerve, and there is evidence of this as shown by loss of tone and wasting of the glutei with increased hyperæsthesia over the gluteal area. Loss of tone in the glutei may be present without wasting of the thigh or leg, and where there is no lesion of the sacro-iliac joint there may be wasting of the thigh or leg and no loss of tone in the glutei. The first and second sacral are the segments responsible for the glutei, and are the roots most liable to damage by a lesion of the sacro-iliac joints. The condition of the glutei resembles an irritative lesion rather than wastage from disuse, whereas the wasting in thigh and leg when present is from disuse. Frequently when the glutei show gross loss of tone and wastage there is no pain on deep palpation of the sciatic nerve in the thigh.

Clinical Examination and Diagnosis.

The history varied widely, but in the majority pain started in the lower back and gradually spread down the back of the leg. Many had had previous attacks; the onset was usually gradual, only 15 being acute. In 15 cases the pain commenced in the hip, but there was no abnormality in the hip movement or in the radiogram of the joint. As the hip derives its nerve-supply from the sacral plexus, among other sources, this points to irritation of the sacral roots.

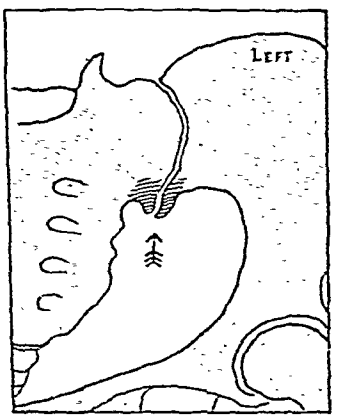
There is always loss of tone in the glutei if a lesion of the sacro-iliac joint can be demonstrated by X ray. Loss or diminution of the Achilles tendon reflex was not a marked feature, being noted in two cases only. One of these showed sacralisation of the left lateral mass of the fifth lumbar, and the other showed alteration in the fourth and fifth lumbar vertebræ with arthritis in one sacro-iliac joint. As the segment regulating this reflex is the first sacral, one would have expected it to be more frequently affected.

Much has been written about postural abnormalities in sacro-iliac strain and stress has been laid on the type of scoliosis. Scoliosis was not a feature in the cases under review, and when present was due either to gross change in the lumbar vertebræ or to muscle-spasm, disappearing when the involved muscles were relaxed. Frequently there is obliteration of the normal lumbar lordosis and a flattening out of the lumbar spines; in acute cases this is marked, especially with the patient prone. In an acute lesion of the sacro-iliac joint there is inability to rest the abdomen on the couch, the body being supported on the chest and knees with the back and thigh held rigid by muscular spasm. If pressure is put on the pelvis to force it down to the couch there is acute pain in the affected joint, due to stretching of the anterior ligament of the sacro-iliac joint. The course I have adopted for demonstrating a lesion of the sacro-iliac joint is as follows:—

The patient being prone on the couch the knee is flexed and a firm grip taken of the ankle while the other hand is placed over the sacro-iliac joint; the hip is then passively hyperextended by lifting the knee off the couch while the pelvis is kept on the couch with the other hand. This procedure stretches the anterior sacro-iliac ligament and elicits pain in the presence of a lesion in the joint. In a normal person this action is painless. This manipulation has been frequently mentioned in literature and is worth more attention.

X rays have confirmed my diagnosis in an appreciable number of cases where manipulation suggested the presence of a lesion, and in no case has a radiogram shown a lesion of the sacro-iliac joint when pain was not elicited by the manipulation.

FIG. 2.



Well-marked osteo-arthritis of left sacro-iliac joint. (Tracing of radiogram.)

It has been assumed that Kernig's or Lasègue's sign stretches the sciatic nerve; American writers consider that limitation in this movement is due to spasm of the hamstrings, pointing out that owing to their origin from the ischial tuberosity any spasm of these muscles exerts a pull on the pelvis and causes movement of the sacro-iliac joint. But if the hip is flexed and the knee extended, the fingers, deep in the popliteal space, feel the internal popliteal nerve tighten when the foot is dorsiflexed, showing that it is possible to exert tension on the nerve. The thigh must make an angle of 150° at least with the trunk before the hamstrings are put on the stretch. In the present series of cases it was possible to flex completely and painlessly the extended leg on the trunk in seven cases, whereas the procedure of hyper-extending the thigh produced pain in the sacro-iliac joint, and a lesion was subsequently shown by the radiogram.

Another recognised method of eliciting pain in the sacro-iliac joint is compression of the iliac crests; Verrall[12] considers that pain felt over the joint on

compression of the iliac crests or of the os pubis is conclusive evidence of a sacro-iliac lesion, and that its absence contraindicates such a diagnosis. I have not been able to demonstrate the value of this sign in any case in this series. The only cases in which I have elicited the sign have been either fractures of the pelvis or some gross destructive lesion—e.g., tuberculosis involving the sacro-iliac joint. Forcible separation of the iliac crests would be more likely to cause pain if the sacro-iliac joint was affected, by stretching the anterior sacro-iliac ligaments.

Other devices for demonstrating inflammation of the joint have been described; I have not used them systematically but have relied for a diagnosis on the wasting and loss of bone in the glutei, Kernig's sign, and hyperextension of the hip. It is necessary to emphasise the importance of a rectal, supplemented where possible by a vaginal examination, in all cases of sciatica. By this procedure it is possible to palpate the sciatic nerves and the lower margins of the sacro-iliac joints, and to eliminate carcinoma of the prostate or any gross intrapelvic lesion.

Treatment.

Treatment is important from the economic point of view. Sciatica affects the wage-earning community at an age when their productive capacity should be at its height and incapacitates for considerable periods. If this paper, which only considers one possible cause, concentrates attention on the nerve roots rather than on the trunk, it will have served its purpose.

It is significant of the change in treatment during the last few years that, as far as I know, no case of sciatica in the hospital during the last six years has had an injection into the nerve sheath, nor had the nerve forcibly stretched under an anæsthetic. Twenty years ago these procedures were common. If my conception of the cause of some sciaticas is correct, the rational line of treatment is to assume that the sacro-iliac joint is the seat of a so-called rheumatic infection. Having eliminated gross disease in the pelvis and a tuberculous infection, it is necessary to exclude any possible source of infection—as in arthritis in any other joint.

The main treatment at the Royal Bath Hospital is hydrotherapy, and I have found the sulphur bath with subaqueous douche most valuable. This may be followed by the Scotch douche or a massage douche bath when the acute pain has subsided, but massage given in the acute or subacute stage aggravates the condition. In conjunction with this, sulphur water by the mouth ensures a complete daily evacuation of the bowels, and in suitable cases colon lavage with sulphur water is employed. A course of treatment of this kind usually extends over three or four weeks, and in the majority of cases results in great amelioration, if not complete disappearance of all symptoms.

For the acute case I have found nothing so beneficial as intravenous non-specific protein. I use T.A.B. vaccine and the same technique as I have described in a previous communication.[13] The results have been even more encouraging than in generalised infective arthritis. I will quote two cases from this series, one with and one without a lesion of the sacro-iliac joint.

CASE A.—Male, aged 39, chauffeur. Influenza five months before admission followed by pain down the right leg. Six weeks in bed. All teeth removed recently. ¾ inch wasting right thigh, buttock folds equal, reflexes normal, great pain on stretching right sciatic nerve. No pain on movement of sacro-iliac joint. Scoliosis with concavity away from the lesions; can only walk with great pain, and with the help of two sticks.

X Ray Report.—Sacro-iliac joints normal. Irregularity between fourth and fifth lumbar vertebræ, convex towards right side; thickening in right lateral articulation between fifth lumbar and sacrum.

Treatment.—Hydrotherapy, as indicated above, for 19 days with little improvement; as it was urgent that he should return to work injections of T.A.B. vaccine were given intravenously. After the first injection the pain was much easier, and after the fourth he was able to stand massage and had discarded his sticks. He was discharged 20 days after the commencement of the injections with no pain on stretching the sciatic nerve, and his only complaint was of a dull ache in the leg after a long walk.

CASE B.—Male, aged 22, mechanic. Rheumatism started in shoulder two years prior to admission, and gradually spread to knees and right hip. Pain and limitation of movement in right shoulder, right knee, right hip; pain in right sacro-iliac joint; wasting of the thigh muscles and loss of right gluteal fold. Walks with help of two sticks, and in great pain.

X Ray Report.—Chronic inflammatory changes in the sacro-iliac joint. Hip joint normal.

Treatment.—Five injections of T.A.B. at four-day intervals with 40 minutes' general massage daily, except on the days of injection. Twenty-one days after the first injection he walked without sticks, the movements at the shoulder and hip were unrestricted, and the knee was greatly improved. There was practically no pain in the sacro-iliac joint.

Conclusions.

The above series of 100 cases represents less than one-fifth of the cases of sciatica admitted to the hospital during the past six years, and was selected because radiograms of the sacro-iliac joint had been taken. The following conclusions seem justifiable:—

1. Arthritis of the sacro-iliac joint accounts for an appreciable proportion of cases of sciatica, 36 per cent. in this series.
2. The symptoms are due to a periarthritis involving the anterior sacro-iliac ligament, the pyriformis muscle, and the adjacent radicals of the sciatic nerve, chiefly the first and second sacral nerves.
3. It is possible to diagnose this condition with a reasonable degree of certainty.
4. X rays confirm the diagnosis in many cases by showing spur formation, indistinct outline, or fusion of the sacro-iliac joint.
5. Treatment should follow the course indicated in arthritis or periarthritis of other joints of the body.
6. For the acute condition, intravenous injections of T.A.B. vaccine give the best chance of removal of symptoms in the shortest possible time.
7. Strain of the sacro-iliac joint may be a predisposing factor in the condition, but is not a common sole cause of sciatica in this country.

In conclusion, I should like to express my sincere thanks to my colleagues on the staff of the hospital for allowing me to supplement my cases from theirs. My thanks are also due to Dr. Hitchcock, one of the honorary radiologists, who kindly scrutinised the radiograms, and to Mr. Lissimore for his pen-and-ink sketches and the slides he made to illustrate points raised in the paper.

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INCREASING DEMAND FOR RADIUM TREATMENT.—The urgent need of an adequate supply of radium for the treatment of cancer patients for West Lancashire has long been felt in Liverpool and a scheme is to be brought forward to establish a radium institute in Liverpool at a cost of £100,000. A representative committee of the Cancer Hospital and the four large general hospitals and other institutions is considering the question. Under the scheme patients would not need to be sent to Manchester, as at present, for radium treatment.—The Leeds General Infirmary has issued an appeal for £25,000 with which to buy a supply of radium for the treatment of cancer. It is stated that there is at present no radium in the infirmary.

TREATMENT AND PROPHYLAXIS OF SCARLET FEVER WITH SPECIFIC ANTITOXIC SERUM.*

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THE ætiological relationship between scarlet fever and certain specific strains of the hæmolytic streptococcus has been established through the work of Tunnicliff, Gordon, Dochez, Dick and Dick, Zingher, and others, and their work has changed the views of investigators on the treatment and control of this disease. The injection into horses of these specific strains and their toxic products has been shown to produce an antitoxic serum, for which various workers have claimed favourable therapeutic results. Park,[1] of New York, in his observations upon the use of an antitoxic serum in the treatment of scarlet fever, emphasises the necessity of giving a sufficient dose at the earliest possible moment. He agrees with previous investigators that antitoxin has little effect on septic complications already developed, but that before their onset the serum appears to be of service in preventing them. Gardner Robb,[2] Harries,[3] and Benson and MacIver[4] report satisfactory results from the use of serum in the prompt neutralisation of the specific toxæmia of the disease, and a beneficial effect in lessening the incidence of subsequent complications. Cushing[5] reviews the antitoxin treatment of 500 cases of scarlet fever at the Alexandra Fever Hospital, Montreal. He found that the action of various preparations of serum differed only in degree, the effects varying according to strength and concentration. Antitoxic serum was given to every definite case of scarlet fever, and the findings were controlled by studying the hospital statistics for the previous year of cases of the same clinical type.

Method Adopted.

During the period October, 1926–27, I had the opportunity of treating with antitoxic serum, in the City Fever Hospital, Edinburgh, 500 cases of simple scarlet fever, 10 cases of septic scarlet fever, and 2 cases of the toxic type of the disease. The practice followed was to administer serum, on the day of admission to hospital, to every definite case of scarlet fever of the simple type within the first three days of disease. Included in the series are a few cases to whom serum was given on the fourth day of disease. These cases were of more than average severity, and it was thought advisable to give them the benefit of serum therapy, although it is generally admitted that by this time patients have passed the stage at which antitoxin treatment proves beneficial. Cases of a very mild type or of doubtful diagnosis were not included.

It was not possible to secure adequate control cases admitted during the same months, as I wanted to study the results of serum therapy on as large a number of cases as possible within the prescribed period. For controls, therefore, I studied the clinical course of a similar number of cases of definite scarlet fever admitted to hospital during the preceding year, October, 1925–26. The cases selected from the hospital records were of the same age-period and the same clinical type, and had been admitted to hospital on the same day of disease and on a corresponding date to those in the serum-treated series. Though it is recognised that scarlet fever varies considerably in its severity from year to year, the control cases were selected so as to be comparable in every detail with those treated by serum. This method of comparing and contrasting results in serum and non-serum treated cases is a reliable one, provided the number of cases is large.

* The contents of this paper form a résumé of the work embodied in a thesis which was accepted for the degree of M.D. of the University of Edinburgh.

Type of Serum and Methods of Standardisation.

The preparation used was a concentrated scarlet fever streptococcus antitoxin supplied by (1) Messrs. Parke, Davis and Co. (P., D. and Co.); (2) Messrs. Burroughs Wellcome and Co. (B. W. and Co.). These sera, before they are put on the market, have their antitoxic titre tested, and 10 c.cm. or less of the P., D. and Co. preparation is said to contain an efficient therapeutic dose, able to neutralise 500,000 skin-test doses of scarlet fever toxin. The potency of the B. W. and Co. preparation is likewise tested, and the recommended therapeutic doses are: 10 c.cm. for mild cases, 20 c.cm. for severe cases, and 20–50 c.cm. for cases of a very severe type.

To corroborate these statements the potency of samples of the sera were tested by the Schultz-Charlton blanching test and the toxin-antitoxin neutralisation test. In the former method an intracutaneous injection of a fixed quantity of serum in varying dilutions was performed on patients exhibiting a typical scarlatiniform eruption of under 48 hours' duration. An attempt is thereby made to determine the smallest amount of serum which will show local blanching of the rash. The results obtained varied, but out of a total of 18 patients tested, definite blanching occurred in four cases with 0·2 c.cm. of 1 in 16,000 dilution, in rashes of under 24 hours' duration. In all cases blanching was obtained with 0·2 c.cm. of dilutions up to 1 in 4000 of the serum in question. The results were similar for both types of serum.

The rationale of the second method is to find the smallest amount of antitoxin which will neutralise one skin-test dose of a standard scarlet fever toxin in a strongly Dick-positive individual. From this quantity we can establish a unit of antitoxin (i.e. the amount which neutralises 100 skin-test doses of toxin), and can thus calculate how many units of antitoxin are contained in a given amount—e.g. 1 c.cm. of the antitoxin. Thirty-four Dick-positive diphtheria-convalescent children were tested, and from the results in 14 of these cases the serum was calculated to be able to neutralise 50,000 skin-test doses of toxin per c.cm. Again the findings were not consistent in all the patients tested and, taking the results as a whole, the potency of the samples of sera in terms of the ability to neutralise scarlet fever toxin seemed to vary between 10,000 and 50,000 skin-test doses per c.cm.

Prophylactic and Therapeutic Dosage of Serum.

There are many difficulties in the methods of standardisation of scarlet fever antitoxic serum, and the dosage of these preparations is therefore somewhat uncertain. The method employed in the prophylaxis of scarlet fever by antitoxin is the production of passive immunity, which is expressed in terms of the smallest amount of antitoxin which will render a Dick-positive reactors negative and keep them so for a period of time beyond the longest incubation period of the disease.

A batch of 20 children, all of whom showed positive Dick tests, received an intramuscular injection of 2½ c.cm. of B. W. and Co. concentrated antitoxin (A. 4488F). Of these 50 per cent. became Dick-negative within 24 hours of the injection, and, taking seven days as the longest incubation period of scarlet fever, it was found that 30 per cent. remained Dick-negative for that length of time (Dick toxin ×48, B. W. and Co.). A dose of 5 c.cm. of the same type of serum (A. 4488F) was next employed on 25 Dick positive reactors: 48 per cent. became Dick-negative 24 hours later and 56 per cent. within 48 hours of receiving the injection. They all remained negative for seven days (Dick toxin ×48, B. W. and Co.).

A further series of 20 children were given 5 c.cm. of P., D. and Co. concentrated antitoxin (079761B). Of these 70 per cent. showed a negative Dick test 24 hours later and 95 per cent. within 48 hours; subsequent tests proved that 95 per cent. of this series remained Dick-negative for the required seven days. (Dick toxin B. 3015, B. W. and Co.)

The material used for performing the Dick tests in the last two series of cases differed, as shown by the contr

numbers, and it was thought that this might partly account for the variation in results obtained.

Finally I administered 5 c.cm. of B. W. and Co. concentrated antitoxin (A. 4608A, A. 4608C) to 22 children and used toxins (B. 3782 and B. 3812, B. W. and Co.) for the Dick tests. In this group 60 per cent. became Dick-negative 24 hours later, but only 50 per cent. remained so for seven days.

All these tests were performed upon diphtheria-convalescent patients, and the serum and Dick toxin employed was always used shortly after receipt from the makers.

An opportunity to employ scarlet fever antitoxic serum prophylactically was afforded on two occasions when a case of scarlet fever developed in a diphtheria ward. The procedure adopted was to Dick-test all the contacts, and on the next day to give to those showing a positive Dick test and negative control an intramuscular injection of 5 c.cm. of concentrated scarlet fever streptococcus antitoxin.

CASE 1.—Out of a total of 17 contacts 11 were Dick-positive (Dick toxin B. 3888, B. W. and Co.). Of these only two showed a negative Dick-test 24 hours after the injection of serum (A. 4654B, B.W. and Co.) One of the children who received serum and who remained Dick-positive developed scarlet fever ten days after the primary case had been isolated. This case, developing beyond the longest incubation period of scarlet fever, cannot be regarded as having been infected from the primary source.

CASE 2.—Amongst 15 contacts there were seven Dick-positive reactors (Dick toxin B. 4084, B. 4126, B.W. and Co.), and these were given 5 c.cm. of antitoxic serum (A. 4661D, B. W. and Co.). All of them showed a negative Dick test 24 hours later, and the test remained negative for ten days. No secondary cases of scarlet fever developed.

As the infecting cases in these two outbreaks were promptly isolated the absence of secondary cases is not surprising, and therefore the serum must not be given too much credit.

The views of various workers on the efficient therapeutic dose of antitoxin for cases of simple scarlet fever have differed. The general opinion seems to be that an amount of antitoxin equivalent to 200,000–1,000,000 skin-test doses of scarlet fever toxin fulfils the requirements for cases of average severity.

Each patient in the series of 500 cases of simple scarlet fever received the recommended dose of 10 c.cm. (B. W. and Co. antitoxin being administered to 293 cases and P., D. and Co. serum to the remaining 207). The injection was, in every case, intramuscular into the lateral aspect of the thigh. The ten cases of septic scarlet fever were treated by an intramuscular injection of 10 c.cm of concentrated scarlet fever streptococcus antitoxin followed by 50–100 c.cm. of polyvalent antistreptococcal serum (B. W. and Co.). The therapeutic dose of 10 c.cm. was repeated 12 hours later in both the cases of toxic scarlet fever.

Results of Serum Treatment.

I propose to summarise separately the results of serum treatment in the three types of the disease under consideration—viz., simple, septic, and toxic scarlet fever.

TABLE I.

Age-period in years.	Admission to hospital and day of disease on which serum was administered.									
	First.		Second.		Third.		Fourth.		Totals.	
	S.	C.	S.	C.	S.	C.	S.	C.	S.	C.
0–5 ..	25	26	66	71	44	46	3	3	138	146
5–10 ..	16	16	122	115	67	64	2	2	207	197
10–15 ..	6	5	28	30	35	35	5	7	74	77
Over 15 ..	5	5	25	25	39	40	12	10	81	80
Total ..	52	52	241	241	185	185	22	22	500	500

S = Serum-treated case. C = Control case.

Simple Scarlet Fever.—Table I. shows the age-groups of the serum- and non-serum-treated or control cases and the day of disease on which the patients were admitted to hospital. All patients received their injection on the day of admission. The control cases were treated on purely symptomatic lines.

In evaluating the effects of antitoxic serum I wish to draw particular attention to the following salient points in the clinical course of the disease: (1) temperature curve; (2) nervous manifestations; (3) duration of rash and degree of desquamation; (4) serum reactions; (5) incidence of subsequent complications; (6) duration of stay in hospital; (7) incidence of relapses and second attacks; (8) case-mortality.

Temperature Curve.—In cases of simple scarlet fever the temperature normally falls on the third to fifth days of disease, irrespective of serum treatment, and so it is difficult to ascribe reduction of pyrexia, unless very dramatic, to the effects of serum. Table II. shows the course of the temperature in the serum-treated and control cases.

TABLE II.

Duration of pyrexia in hours.	Admission to hospital and day of disease on which serum was administered.									
	First.		Second.		Third.		Fourth.		Totals.	
	S.	C.	S.	C.	S.	C.	S.	C.	S.	C.
Under 24 ..	19	14	78	73	64	59	5	9	166	155
24–48 ..	28	24	128	98	94	60	12	10	262	192
48–72 ..	3	7	21	47	16	49	3	2	43	105
Over 72 ..	2	7	14	23	11	17	2	1	29	48
Total ..	52	52	241	241	185	185	22	22	500	500

Nervous Manifestations.—The toxin of scarlet fever apparently acts as an exciting factor to the nervous system, whereas that of diphtheria is a depressant. Practically all the cases to whom serum was given on the evening of admission to hospital showed marked improvement in the toxæmic manifestations of the disease within 12 hours. This was most easily judged in adult patients, who invariably admitted that they felt much more comfortable and relatively well within a short time of receiving treatment.

Effects on Rash and Desquamation.—The rash is regarded as due to the toxin of the causal organism, and so it is to be expected that the prompt administration of the specific antitoxin will cause a blanching of the exanthem before its normal time of disappearance. This phenomenon is most strikingly seen in the early rashes of under 48 hours' duration; complete blanching occurred in 60 per cent. of cases within 24 hours. In some cases the rash showed little or no blanching beyond normal limits. This fact may be ascribed to inadequate dosage or to lack of specificity on the part of the antitoxin towards the toxin elaborated by the particular strain of hæmolytic streptococcus. Moreover, rashes of over 48 hours' duration become stained into the tissues of the skin and cannot be blanched by the antitoxin. As was to be expected, the cases showing complete or modified blanching of the rash had an almost imperceptible desquamation.

Serum Reactions.—According to previous observers the introduction of concentrated preparations of serum has resulted in diminished frequency and severity of reactions. Out of the total of 500 cases receiving serum, 41 per cent. showed reactions at periods varying from 4 to 16 days after the injection. In no case did the symptoms give rise to alarm. In 25 per cent. of these cases there was only a rash—usually urticarial in nature—which lasted from a few hours to three days in the most severe cases. The remaining 16 per cent. showed definite signs of serum disease: slight pyrexia, adenitis, fleeting joint pains, and an urticarial eruption.

Calcium chloride was given orally for ten days after the serum injection in doses of grs. 5 to children and grs. 10 to adults thrice daily. It was found to have no

effect at all in reducing the number or intensity of the reactions.

Incidence of Subsequent Complications.—The power which an antitoxic serum possesses of preventing or reducing the various complications associated with scarlet fever forms the main line of investigation of the therapeutic value of such a measure. Most workers agree that serum, even when given on the first day of disease, is not an absolute safeguard against complications. A comparison of the incidence of complications in 500 cases treated with serum and a similar number of control cases is given in Table III.

TABLE III.

Complications.	Admission to hospital and day of disease on which serum was administered.							
	First.		Second.		Third.		Fourth.	
	S.	C.	S.	C.	S.	C.	S.	C.
Adenitis (late non-suppurative) ..	5	8	16	33	25	20	2	2
Adenitis (late suppurative)	2	—	1	1	1	1	—	—
Arthritis	—	1	4	4	3	6	2	2
Nephritis	—	—	—	2	1	1	1	—
Otitis media	1	2	12	4	8	13	2	—
Purulent rhinitis ..	3	8	10	10	6	9	1	—
Adenitis, nephritis ..	—	—	—	1	—	—	—	—
Adenitis, purulent rhinitis	1	—	4	8	2	9	—	1
Adenitis, arthritis ..	—	—	—	6	—	2	—	—
Adenitis, otitis media	1	1	6	7	2	3	—	—
Adenitis, otitis media, rhinitis	—	5	2	5	1	2	—	—
Adenitis, rhinitis, lobar pneumonia	—	—	1	—	—	—	—	—
Arthritis, otitis media	—	—	—	—	—	—	—	1
Nephritis, otitis media	—	—	—	1	—	—	—	—
Nephritis, erysipelas ..	—	—	—	1	—	—	—	—
Otitis media, rhinitis ..	2	3	4	4	1	3	1	—
„ „ jaundice ..	—	—	—	—	—	1	—	—
Rhinitis, vaginitis ..	—	—	—	—	—	1	—	—
Broncho-pneumonia ..	—	—	—	1	—	—	—	—
Lobar pneumonia, empyema	—	—	1	—	—	—	—	—
Pleurisy with effusion	—	—	—	—	—	1	—	—
Peritonsillar abscess ..	—	—	—	—	1	—	—	—
Septic dermatitis ..	—	—	—	—	—	—	1	—
Totals	15	28	61	88	51	72	10	6

As the table shows, the complications in cases not receiving serum until the fourth day of disease were more numerous than in the control series, and the best results were obtained amongst cases treated on the first day of disease. The table shows that the number of multiple complications in the control cases was twice that in those treated with serum. The incidence of arthritis, nephritis, and otitis media in cases treated with serum during the first three days of disease and in a corresponding number of control cases is shown in Table IV.

TABLE IV.

Complications.	S.	C.
Arthritis	7	19
Nephritis	1	6
Otitis media	40	54

Arthritis occurred chiefly in adult female patients; and the likelihood of its being a serum phenomenon was, as far as possible, carefully excluded. The nephritis was an extremely mild type and occurred in a female aged 12 who received serum on the third day of disease.

Duration of Stay in Hospital.—The usual quarantine period of four weeks for simple, uncomplicated cases of scarlet fever was not altered for serum-treated patients, and if there were complications the cases were detained in hospital until clear of infection. Fresh complications developed after the fourth week of disease in 14 serum-treated patients who had already shown complications, except one who was discharged as a clean case at the end of the fourth week and who was readmitted one week later with a purulent rhinitis and otitis media. The number of weeks in hospital beyond the usual quarantine period was 485 for the 500 serum-treated cases, while for the control series the figure was 680 weeks.

Incidence of Relapses and Second Attacks.—The serum-treated cases showed three genuine relapses during the fourth week of the disease, an incidence of less than 1 per cent., which cannot be regarded as exceeding normal limits. Second attacks of scarlet fever, though rare, do occur, and a girl of 5 who received her injection on the second day of disease had a second mild but quite definite attack nine months later. The Dick test on the second day of disease was negative, which suggests that the particular strain of hæmolytic streptococcus causing the second attack differed from that causing the primary disease.

Case-mortality.—The case-mortality for simple scarlet fever is at present very low, owing to the mild type prevalent in this country. It is therefore difficult to imagine that serum therapy will cause any dramatic change in this. One death occurred in the serum-treated cases, and was attributable to an intercurrent tuberculous peritonitis. There was also one fatal case in the control series.

Septic Scarlet Fever.

It was hoped, by the combined administration of the two types of serum—concentrated scarlet fever streptococcus antitoxin and polyvalent antistreptococcal serum—to bring about improvement simultaneously in the two aspects of infection—viz., the specific hæmolytic streptococcus of scarlet fever and the secondary invading organisms. The effects have been observed on ten cases of septic scarlet fever. The number is too limited for definite conclusions, but the opinion formed of its efficacy is favourable. The cases were all of a very severe type with marked constitutional symptoms and exaggeration of the faucial condition, together with cervical adenitis and purulent rhinitis. Six, after a febrile period varying from 3–12 days after the injection of serum, experienced an uninterrupted convalescence and were discharged from hospital during the fifth week of disease. Three developed otitis media, and in one of these the condition proceeded to mastoiditis requiring operation. They were discharged from hospital at the end of 9, 9, and 15 weeks respectively. The remaining child developed broncho-pneumonia during the fifth week of disease and remained in hospital until the end of the ninth week of disease. There were no deaths.

Toxic Scarlet Fever.

It is in this type of the disease that we look for the most dramatic results of specific serum therapy, if given in sufficient dosage and early enough in the course of the disease, when the patient has the power to respond. The two following cases, which may be regarded as genuine examples of toxic scarlet fever, were treated with concentrated scarlet fever streptococcus antitoxin.

CASE 1.—Female, aged 7, admitted to hospital on second day of disease. Three more cases of scarlet fever from same family. Temperature, 103° F.; pulse-rate, 168; respirations, 36. Pulse soft and thready. Rash poorly developed.

Lips cyanosed. Fauces congested. Severe vomiting and diarrhœa. Extreme restlessness. 10 c.cm., P., D. and Co., antitoxic serum given intramuscularly on admission. Very little improvement in general condition 12 hours later. 10 c.cm. of same type of serum given intravenously in half a pint of warm sterile normal saline. Very marked improvement 12 hours later. Vomiting and diarrhœa ceased. Restlessness gone. Temperature and pulse-rate reached normal 24 hours after second injection. No serum reaction. Convalescence uneventful. Discharged from hospital on the thirty-seventh day of disease.

CASE 2.—Female, aged 10, admitted to hospital on the third day of disease. Temperature, 103° F.; pulse-rate, 156; respirations, 32. Poorly developed punctate erythema over trunk. Tongue and fauces typical of scarlet fever. Slight cyanosis of lips. Pulse rapid and soft. Extreme restlessness. Marked diarrhœa. No vomiting. 10 c.cm., B. W. and Co., antitoxic serum given intramuscularly on admission. No definite improvement 12 hours later. 10 c.cm. of same type of serum given intramuscularly (attempt at intravenous administration failed). Marked improvement 24 hours after second injection. Restlessness and diarrhœa ceased. Temperature and pulse-rate normal 48 hours after second injection. No serum reaction. Convalescence uneventful. Discharged from hospital on the thirty-fourth day of disease.

Conclusions.

1. The potency of different samples of scarlet fever streptococcus antitoxin has, up to the present time, varied considerably as shown by the methods in use for testing its antitoxic titre. 2. A minimum of 5 c.cm. of the average serum at present on the market should be administered as a prophylactic dose. 3. The administration of antitoxic serum within the first three days of disease produces a favourable effect in counteracting the specific toxæmia. 4. The reactions following the administration of a reliable concentrated antitoxin are not severe. 5. An amount of antitoxin sufficient to neutralise 500,000 skin-test doses of scarlet fever toxin should be regarded as the minimum therapeutic dose for simple scarlet fever. 6. The full therapeutic dose should be given at the earliest possible moment to obtain the best results. 7. When given within the first three days of disease it lessens the incidence and reduces the severity of subsequent complications. 8. The therapeutic efficacy of the serum diminishes with each day of delay in its administration, and beyond the third day of disease it seems to have little effect in influencing the incidence of subsequent complications. 9. From the results obtained it does not seem advisable to reduce the quarantine period to less than four weeks in cases treated with antitoxin, but the total period of hospitalisation is reduced because the serum therapy lowers the incidence and severity of complications. 10. Antitoxin treatment of scarlet fever does not appear to increase the incidence of relapses beyond normal limits. 11. There is reason to believe that the treatment of septic scarlet fever by a combination of specific antitoxic serum and polyvalent antistreptococcal serum cuts short the course of disease and lessens the liability to the development of subsequent septic complications. 12. Specific antitoxic serum, if given early and in large doses, is an extremely efficacious treatment for toxic scarlet fever. Intravenous administration is more advantageous than intramuscular, as it ensures a more rapid maximum action.

I wish to take this opportunity of expressing my grateful thanks to Dr. W. T. Benson, medical superintendent, Edinburgh City Fever Hospital, for his kind permission to carry out these investigations and for much useful help.

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WEST END HOSPITAL FOR NERVOUS DISEASES.—About £8000 was raised at the jubilee dinner of the hospital held at Grosvenor House last week in response to an appeal for £10,000 for development work.

Clinical and Laboratory Notes.

A CASE OF CONGENITAL VALVULAR OBSTRUCTION OF THE URETHRA.

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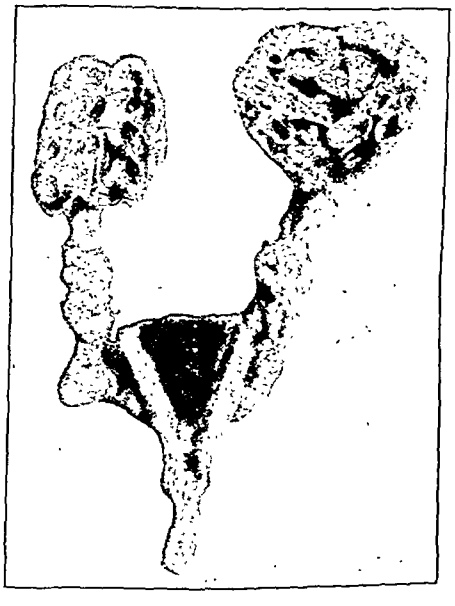
THE condition of congenital bilateral hydronephrosis together with dilatation of both ureters is comparatively well known, but any example which helps to shed a light upon the pathogenesis of this condition is worth recording and considering from every available aspect. The following case is one of the youngest recorded, and the facts noted during the 20 days of life were checked and correlated at the post-mortem examination.

A *primipara*, aged 34, had a normal pregnancy until the thirty-fourth week, when slight œdema of the lower extremities developed and the urine contained a trace of albumin. The œdema was progressive until delivery, although no signs of toxæmia could be found, and the

FIG. 1.



Showing the whole urinary apparatus. Both kidneys are hydronephrotic, the ureters are dilated and tortuous, the bladder wall is hypertrophied, and the prostatic urethra is dilated.

systolic blood pressure remained steady at 130 mm. of mercury. The presentation was a persistent breech with extended legs, and delivery was by Cæsarean section at full term. The mother had no pyrexia, and convalescence was uneventful. At the time of the operation it was noticed that there was practically no liquor amnii. Although the membranes had ruptured earlier in the day only a normal quantity of liquor had been lost during the few hours of labour that preceded delivery.

The child was a well-developed male, weighing 8¼ lb. The scrotum and penis were very œdematous, and there was a well-marked right-sided torticollis, and a linear discoloration amounting almost to an abrasion of the skin of the subclavicular region where the head appeared to have been pressed closely against the chest wall. The child cried well, but from the first he seemed lethargic and took the breast

with difficulty. He never vomited. The œdema of the scrotum and penis subsided slowly, but the abdomen remained very distended. During the first 24 hours he was reported not to have passed urine and after that it was noticed that micturition was never in a continuous stream but drop by drop and accompanied by quite definite straining. Phimosis was not present nor was there any pinhole condition

FIG. 2.

Microphotograph (low power) of a portion of the right kidney, showing a great excess of fibrous tissue, with a varying degree of dilatation of the tubules.

of the meatus, but all methods to promote the flow of urine failed, and by the eleventh day, although there was practically no œdema, the distended bladder could be felt between the pubes and the umbilicus.

On the twelfth day Mr. Neil Sinclair saw the child, and after passing a No. 1 gum-elastic catheter he drew off 2¼ oz. of urine. The first two inches of catheter entered without much difficulty, but then it appeared to be gripped as though by a muscular spasm, and the obstruction was only overcome by maintaining steady pressure for a minute or two. He diagnosed obstruction in the prostatic urethra, probably valvular, and advised regular catheterisation in the hope of breaking it down mechanically. Whatever the nature of the obstruction, it allowed the passage of a catheter into the bladder, yet acted as a barrier to the outward flow of urine. The difficulty of catheterisation became more marked with each attempt. For three days a catheter was passed, but on the three succeeding days all efforts to overcome the obstruction failed, and the child became very limp and drowsy. As the bladder remained obviously distended, Mr. Sinclair again saw the child, and succeeded in drawing off 3 oz. of blood-stained urine through a ureteric catheter. In spite of the frequent catheterisation there was no improvement in the rate of micturition; urine was still passed drop by drop and continued to contain blood. On the nineteenth day the bladder became harder, and was the size of a tangerine orange. The ureteric catheter was passed, but no urine could be obtained. The child was by now in a uræmic state, and became convulsed that evening. Death took place 12 hours later.

Post-mortem Examination.

The external appearance of the body was normal except for the unusual size of the abdomen. There was no œdema. When the abdominal cavity was opened free blood-stained fluid was found and petechial hæmorrhages were scattered over the visceral and parietal peritoneum. The kidneys, ureters, and bladder, with about two-thirds of the urethra, were dissected out and removed entire, the symphysis pubis being divided to facilitate the dissection of the urethra to a point beyond the site of the supposed obstruction (Fig. 1).

Kidneys.—Both kidneys were enlarged, and their surface was studded with numerous transparent cysts ranging in size from a pin's head to a large pea. The left kidney measured 8 × 4½ cm. and the right 6 × 3½ cm. Both were definitely enlarged. The capsule stripped with difficulty, being tough in places and adherent, and the surface of the underlying kidney was covered with numerous pin-head cysts. The pelvis was very dilated, and the calyces extended almost to the edge of the kidney substance, forming wide pockets and reducing the renal tissue to a narrow rim 2 mm. thick. The terminal ramifications of the pelvis seemed to have no communication with the cysts on the outer surface of the kidney, suggesting the possibility of a concurrent polycystic condition in addition to the hydronephrosis. Microscopically the most remarkable feature of the kidney was the great excess of fibrous tissue throughout. For the most part this was arranged in whorls around small islands consisting of three or four small tubules. In other areas it enclosed large cystic spaces consisting of dilated tubules. Only a few glomeruli could be discerned, and these had undergone hyaline degeneration (Fig. 2).

Ureters and Bladder.—Both ureters were enormously dilated, resembling small intestine, and were doubled upon themselves in a series of S-shaped curves, the actual length being thus about double the apparent length. Their width was 1 cm. The bladder was the size of a tangerine orange, and showed great but uniform hypertrophy of its musculature. The muscle wall measured 1 cm. in thickness, but there was no special thickening to indicate a sphincter. The mucosa was corrugated, and there was an intense hæmorrhagic cystitis which ceased at the trigone. The ureteric orifices were closely contracted.

Urethra.—The verumontanum was well developed and showed a longitudinal groove down its centre. In the normal infant the ridge of the verumontanum gradually fades out on the floor of the urethra, but in this case the verumontanum was prolonged forwards, diverging into two prominent ridges covered by mucosa, which eventually fused with the roof of the urethra. The channel of the urethra on the outer side of the two ridges of the verumontanum thus ended in a blind cul-de-sac. Stretching between the two ridges was a thin loose membrane or valve, attached at its distal end to the roof of the urethra. At the point where the verumontanum forked into the two ridges there was a small opening through the membrane, through which urine in the prostatic urethra could pass down under the membranous valve into the penile urethra. Because of its laxity the membrane actually lay on the floor of the urethra between the ridges of the verumontanum. An entering catheter could raise up the membrane and pass through the small opening into the prostatic urethra, but considerable force would be required to expel urine down through the opening into the penile urethra (Fig. 3).

FIG. 3.

A closer view of a small part of the bladder and of the urethra. There is a hæmorrhagic cystitis down to the inter-ureteric bar. At the distal end of the verumontanum can be seen the valve formation, under which a short stilette has been passed.

Discussion.

The thin curtain of tissue at the level of the verumontanum was clearly a developmental fault, and must have been present from the earliest weeks of fœtal existence. The secondary changes which resulted from the valvular obstruction—such as the great hypertrophy of the bladder muscle, the increase in length and width of the ureters, and the dilatation of the renal pelves with extreme diminution of the functioning kidney tissue—cannot conceivably have developed during the 20 days of life. Their production must have begun during, at any rate, the later stages of intra-uterine existence, and they argue some considerable effort by the fœtus to micturate. The muscular development of the bladder was such that, when exerted to its utmost during life, the valvular obstruction could be partially overcome and a small proportion of the urine expelled. That this was never without great difficulty was shown by the interrupted flow and the abdominal straining that accompanied micturition.

The hypertrophy of the bladder and the dilatation of the ureters seem to have been purely a response to prolonged mechanical obstruction. The kidneys formed the final barrier and sustained the greatest damage. The kidney-substance had atrophied almost to non-existence, and had undergone profound fibrosis. The cystic distension of some of the tubules was presumably due to partial or complete obliteration of some portion of the lumen, preventing the normal passage of urine out of the tubule.

The case may shed some light upon the pathogenesis of congenital cystic disease of the kidney, for the condition of the kidneys was closely comparable to congenital cystic disease, the cystic condition being the result of an intra-uterine renal fibrosis. Further, in this case the fibrosis of the kidneys was secondary to an organic structural defect in the urinary apparatus.

The small amount of functioning kidney-substance would certainly have proved inadequate to meet the demands of the growing organism, and the infant would appear already to have been suffering from toxæmia due to inefficiency of renal function from birth onwards, as evidenced by its abnormal drowsiness and lethargy, culminating in the uræmic convulsion just before death. The extent of the pathological changes in the urinary tract suggests that their formation commenced during intra-uterine life, probably from the time when urinary secretion first became a function of the fœtus. Bearing in mind that this urinary output was considerably impeded, it is of interest to recall the fact, noticed at operation, that the liquor amnii was unusually diminished in amount. The functions of the amniotic fluid are still not entirely understood, but the presence in it of urea and other urinary constituents is generally assumed to denote some connexion between it and the urinary excretion.

In America H. H. Young, W. A. Frontz, and J. C. Baldwin [1] have fully investigated the formation of congenital valves in the urethra, and have operated with success upon some of these cases. In a recent communication by F. J. Poynton and one of us [2] the clinical symptoms to which this condition may give rise were described, and attention was drawn to the ease with which it may be overlooked at post-mortem examination. In the various examples there recorded of dilatation of the bladder and ureters due to some organic obstruction, infection of the urinary tract had invariably taken place by the time the child was brought for treatment. The onset of the infection may be sudden, but it generally persists for months or years before the patient succumbs. It follows that those instances of "pyelitis" in childhood which do not respond satisfactorily to treatment, but pass insidiously into a chronic or relapsing form, should be submitted to the most careful investigation, with the aid of cystoscopy and pyelography, in an attempt to discover whether there is any remediable congenital deformity of the urinary organs.

The longer the individual survives, the more are the direct secondary results of the deformity obscured by the features of bacterial infection, until it becomes very difficult to say which is the cause of the changes found in that part of the urinary tract furthest removed from the site of the deformity. Hence it is important to investigate thoroughly every case of abnormality of the urinary tract, especially in its earliest stages.

Conclusion.

The case recorded shows a gross abnormality of the whole urinary tract, and in view of the absence of bacterial infection as one of the causal factors, we consider that all the changes in the urinary tract were due to the congenital valvular deformity of the urethra.

Our thanks are due to Miss Geraldine Barry, F.R.C.S., whose skilful post-mortem examination facilitated further investigation of the case, and to Dr. J. G. Greenfield, who kindly made the microphotograph.

[1] Jour. Urol., 1919, iii., 289.

[2] Poynton, F. J., and Sheldon, W. P. H.: Arch. Dis. in Childhood, 1927, ii., 251.

GASTRIC SECRETION IN PHTHISIS.

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It is commonly believed that in most cases of pulmonary tuberculosis the gastric secretion of hydrochloric acid is diminished. Knud Faber [1] stated in a recent lecture that achylia occurs in 33 per cent. of cases.

The work reported in this article was undertaken to verify this theory if possible, for a lack of digestive juices, if it exists, should surely be an indication for treatment in practically all cases of this disease. However, an investigation of the literature does not show any such general agreement with these ideas as some writers lead us to believe, and in fact several workers, such as Einhorn,[2] report that they have found hyperacidity in many, especially early, cases. Vague indigestion is the common lot of many phthisical patients, who have been described epigrammatically as potential dyspeptics. Probably indigestion is less common now that the older treatment of forcing food is rarely carried out; it was probably more often due to the "cure" than to the disease. Nevertheless, everyone working in this department must realise that these patients are more than normally subject to digestive disturbances. The frequency of indigestion as a symptom varies greatly, to judge from figures that have been published. For example, one author [3] states that in 17 per cent. of male and 72 per cent. of female patients the earliest sign of phthisis is dyspepsia, while others have given such figures as 94 per cent.,[4] 64 per cent.,[5] and 53 per cent.[6] The form of the dyspepsia varies, but the principal symptoms are fullness, flatulence, and pain, often, however, amounting to little more than a vague discomfort.

In 80 consecutive cases of early male adult pulmonary tuberculosis admitted into King George V. Sanatorium, Godalming, into whose history a special inquiry was made for the previous existence of digestive symptoms, the following percentage incidence of the various symptoms was discovered:—

No digestive symptoms of any kind	52	Vomiting	2
Flatulence	18	Heartburn	1
Fullness	12	Bad taste in mouth	1
Indefinite pains	9	Migraine	1

These numbers indicate that the incidence is not very high, but a series of test-meals was conducted in order to determine whether or not the indigestion was associated with altered gastric secretion. The test-meal was that recommended by Ryle and now in common use—that is to say, the ordinary fractional test-meal after the ingestion of gruel. Specimens were examined for free hydrochloric acid and total acidity at the commencement of the examination and after 15 minute intervals, up to eight or more specimens.

Classification of the Titrations.

—	Free hydrochloric acid.*	Total acidity.*
Normal	20–40 c.cm.	40–60 c.cm.
Hyperacidity	More than 40 c.cm.	—
Moderate hypo-acidity	11–20 c.cm.	—
Marked "	Less than 11 c.cm.	Less than 25 c.cm.

* Both expressed as the equivalent of 100 c.cm. in terms of decinormal alkali.

According to all observers, there is a very wide range of normality, and in a series of 100 normal persons readings well below and well above the

average—i.e., the figures obtained from 80 per cent.—will be found in several cases. I have adopted the above classification of the titrations for the purpose of convenience.

Twenty-one cases showing no digestive disturbance whatsoever were investigated. All were male adults and early but proven cases of phthisis. The following results were recorded :—

	Per cent.		Per cent.
Normal	62	Marked hypo-acidity	10
Hyperacidity	10	No free hydrochloric acid	15
Slight hypo-acidity ..	5		

Although there is a slight tendency towards hypo-acidity the figures are, on the whole, not very widely divergent from those of a similar series of normal individuals.

Of 18 cases with symptoms of indigestion, 77 per cent. were normal and 23 per cent. showed hyper-acidity. It is to be noted that there were no cases with decreased acid-secretion. If it is possible to form conclusions from such a short series this suggests that diminution of gastric secretion is not part of the picture of early tuberculosis in men, and that when symptoms of indigestion arise, whether prominent or not, they do not necessarily indicate lowered acid secretion. These results agree in the main with those of Fairfield Thomas,[7] who reported on analyses made along similar lines on the gastric secretion of 27 cases of pulmonary tuberculosis in varying stages. Theories of chronic gastritis, anæmia of the gastric mucosa, or even ischæmia of the whole digestive tract which purport to account for an altered secretion are merely guesses based on indefinite and probably fallacious data. Gastric and duodenal ulceration are associated as a rule with hyperchlorhydria, and if pulmonary tuberculosis were associated with hypochlorhydria (using these terms in a loose sense), the two lesions should be combined extremely rarely in any one patient. This is not so, for in every large institution for the tuberculous a certain percentage suffer from ulceration. Moreover, phthisis in a sufferer from either of the previous diseases does not necessarily produce any favourable effect on the gastric condition. I was recently in charge of a patient, under treatment for an active focus in his lungs, who died from hæmatemesis and melæna, proved at autopsy to be from a gastric ulcer. I do not believe this was a very exceptional case.

Acid Therapy in Phthisis.

Hydrochloric acid was given to a series of 24 cases, selected at random, of those suffering or who had suffered from indigestion and to those who had never, even on careful inquiry, given any history of such symptoms. It was thought that if an appreciable number of these were suffering from a lack of gastric juice they might, on its partial and artificial replacement, show some sign of improvement in general health, especially on their weight charts. Of these 24, one declared himself unable to take the acid; five, otherwise at a standstill, showed no change; ten, who were improving slightly, continued their improvement without any obvious acceleration; two appeared on the surface to go downhill after the administration of the acid; two appeared to show definite improvement (one of these had ultra-violet therapy at about the same time), and one stated that he felt very much better than he ever had previously, but examination of his charts and his physical signs showed no material change.

These results, therefore, do not encourage further investigation, for they tend to show that the reports in the early stages of phthisis of definite changes in the secretory response have been exaggerated.

I have to thank Dr. James Watts, under whose care these patients were, for his assistance, and for permission to publish the results.

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SHOT IN THE VERMIFORM APPENDIX.

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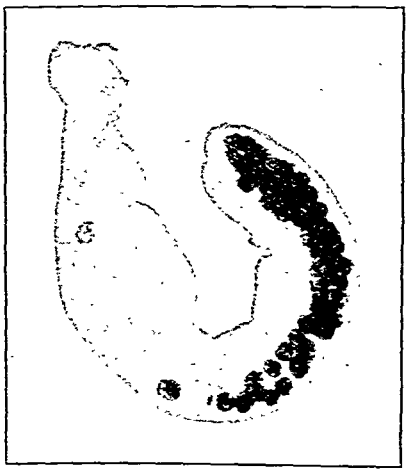
FOREIGN bodies in the vermiform appendix are relatively frequent findings, and numerous cases have been recorded in which the occurrence would seem to have played an important part in the subsequent pathology. Mahoney,[1] recording a case in 1921, in which a pin was discovered occupying the lumen of a child's appendix, reviewed the literature up to that date, and quoted observations on 81 cases, the earliest of which was dated 1840, when Houston,[2] of Dublin, discovered a foreign body in the appendix on post-mortem examination. Since Mahoney's paper was published records of 29 cases have appeared in



Radiogram of the appendix.

English and foreign literature. This total of 110 cases affords, of course, no true idea of the incidence of the occurrence, as it is likely that only a relatively small proportion of the total cases has been recorded.

An Unusual Case Related.

A few months ago a case in this category came under observation, and, as it presented some unusual and interesting features, it seems reasonable to record the details.

Mr. C., an active man of 51 years, complained of discomfort in the right lower quadrant of the abdomen. The discomfort was occasionally exaggerated into attacks of acute pain, which were short in duration and unaccompanied by any disturbance of temperature or general illness. There was no history of vomiting, constipation, or urinary disturbance. The appetite remained good and there was no discomfort after food, but the patient (a trained and shrewd observer) recorded the fact that the passage of flatus afforded temporary relief from the discomfort.

Abdominal examination was negative except for the fact that pressure immediately below and to the right of the umbilicus produced a certain degree of discomfort. In the history of the previous health the only positive feature was the record of recurring attacks of gout, dating from 1915.

X ray (barium meal) investigation was carried out in March, 1928, and the radiographer recorded the presence of small shot in the appendix; others who saw the plates were inclined to regard the appendicular shadow as being due to barium entering the lumen of the organ. As later events

showed, the observation of the radiographer was correct. The X ray findings, whatever the explanation, suggested an abnormal condition of the appendix, and operation was recommended in the hope that an appendectomy might relieve the symptoms.

Operation on April 24th, 1928, revealed an appendix 9·5 cm. long containing what appeared to be a great number of small shot. Later computation showed the actual number to be 48, and, with two exceptions, they were collected and cemented together in the distal half of the organ (see figure). The peritoneal coat of the appendix showed no trace of inflammatory change, and a later microscopical examination revealed no infection or reaction in the underlying layers. As far as could be ascertained, all the shot were uniform in size, and one pellet submitted to a gunsmith was classed as No. 6.

The post-operative course was uneventful, and it is satisfactory to record that the operation was successful in relieving the symptoms.

Certain Related Facts.

Such are the simple details of the case, but there are certain related facts which are of interest. "And thus the whirligig of time brings in his revenges," for the victim of this occurrence is a well-known sportsman and game shot. The figures in his game book total a number close upon 250,000, and, as the edict of the physicians who treated his gout forbade the use of butcher meat, there was a liberal consumption of game. It is evident that to this we may ascribe the remarkable collection which the appendix displayed, and that yet another "record bag" was added to the list. It may be that the ghost of some grouse will echo with Valentinian.[3]

"I love a dire revenge. Give me the man that will all others kill and then himself."

In a more serious vein, however, there is no doubt that the presence of this heavy collection of lead shot (one-seventh of an ounce) was responsible for the train of symptoms complained of—the dragging discomfort in the right side, and, as a result, of recurrent attacks of cæcal spasm, the more acute and short-lived pains. The appendix wall itself showed no sign of inflammatory reaction; in fact it was probably in some measure protected from infection, partly by the matter which occupied the interior and partly by the potential antiseptic properties of the contents, but its weight and the reflex disturbance which this engendered no doubt resulted in a mesenteric drag and its associated signs and symptoms.

One clinical point there was into which significance might be read, and one regrets that the matter was not more carefully noted—there was an area of cutaneous hyperalgesia, perhaps unduly prominent and corresponding to the skin distribution of the appendix. It seems possible that the irritation of the mucous surface by the foreign bodies instituted the reflex, for a similar observation has been made in connexion with threadworms in the appendix. Apart from secondary perforation of the appendix, one of the dangers quoted in connexion with foreign bodies is the development of a tumour. An example of this has recently been recorded by Thorek.[4] In the present instance there was no trace of anything suggesting a cell reaction or degeneration, and it was evident that worse things than lead may gain entrance to or evolve within the lumen of the vermiform appendix.

It may be that a record of this kind adds little to the store of knowledge upon which our art accrues, but to me it was an unusual occurrence, and I said to myself "*rara juvant.*"

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STORNOWAY HOSPITALS.—Mr. T. B. Macaulay, of Montreal, President of the Sun Life Assurance Company of Canada, has within the past two years given nearly £20,000 to various institutions in Stornoway. He has now given £8000 to the endowment fund of the Lewis Hospital and with £12,000 capital money contributed by the Treasury, through the Scottish Board of Health, this should make it possible considerably to increase the efficiency of the institution.

Medical Societies.

MEDICO-LEGAL SOCIETY.

A MEETING of this Society was held on Nov. 22nd, with the President, Sir WILLIAM WILLCOX, in the chair. Dr. L. A. WEATHERLY read a paper on

JUVENILE PSYCHOLOGIC DELINQUENCIES.

He said that the study of human nature must go hand in hand with the study of the individual's mind, and physiology, pathology, and sociology must aid psychology. As Dr. J. Devon had said, "the only one principle in penology is to find out why the delinquent did wrong and make it not worth his while to do it again." Among a wealth of contributory factors one major cause could always be found. Criminal conduct was instinctive conduct and adapted to savage rather than civilised countries. Either the instincts and emotions were too strong for the intelligence, or the intelligence was too weak to control the instincts or emotions. The inherited disposition of these instincts might be for good or evil, and if they were allowed to run riot unsocial conduct must result. The causes bringing about lack of control over or accentuation of the worst features of instinctive emotional activities were complicated. Any physical ill-development might have this effect—for instance, defective sight or hearing and orthopædic deformities. The late Mr. Thomas Holmes had been convinced that the most serious causes of crime were more physiological than psychological. Secondly came pathological causes—mental disease leading to crime. Dementia præcox patients were subject to sudden inexplicable impulses, usually aggressive and destructive, yet to the ordinary observer the sufferers seemed normal and well-behaved. Dr. W. C. Sullivan had said that homicide was, par excellence, the crime of the epileptic. Encephalitis lethargica entirely altered the character of its young victims so that they took an absolutely immoral attitude to social life. They should be sent to an institution and never to prison. A peculiar pathological condition sometimes followed injuries to the viscera or abdominal operations; the character would alter and the youth might develop sexual perversions. Sometimes the alteration of sleep in change from day- to night-work would have a grave effect on a boy's emotional centres. Evidence of certifiable insanity in these pathological cases was rarely found, and some were tried and convicted without any defence or realisation of the cause of their criminal act. The present system of probation permitted appropriate care and treatment. The third group of causes was sociological. It was an error to suggest that every delinquent was the helpless victim of his inborn nature; there were many contributory environmental causes. Dr. Burt had concluded that poverty played only an indirect part and that there were more good children in the hovels of Hoxton than in the mansions of Mayfair. The sociological causes of crime were defective discipline, a family history of vice and crime, detrimental companions, excessive or inadequate amusement, lack of healthy pursuits, and defective family relationships. Cases of mental deficiency should be easily diagnosed and sent to institutions; it was a scandal that the institutional accommodation was so inadequate. The subnormal, however, was a much more difficult problem. Shuttleworth and Potts had described a class of case in which the strain of puberty produced a temporary lapse of moral sense. Prison was no good for these people, but tact, confidence, and kindness might make them good citizens. Most subnormals required something between Home Office schools and Borstal institutions on the one hand and simple supervision under a probation officer on the other.

Measures to Deal with Young Offenders.

Juvenile courts had been introduced in 1908, and children under 17 could now only be sent to prison

under exceptional circumstances. Reformatory schools and industrial schools—now called Home Office schools—had been reorganised, and probation officers were appointed to every court of summary jurisdiction in the kingdom. The report of the departmental committee appointed in 1925 was full of interest and excellent suggestions. It advocated juvenile courts in every court of summary jurisdiction, to be held quite apart from the police-court, and urged that three special magistrates should be appointed to each, one of the three being a woman. Coöperation between juvenile courts and education authorities was essential, and the help of psychology and psychiatry should be enlisted. The report suggested the establishment of hostels for probationers whose home environment was unsuitable, and called attention to the need of observation centres and remand homes—such as existed in America and had been described by Dr. R. G. Gordon in "Autolycus." Farm colonies were, in the speaker's opinion, the best kind of institution for subnormals, and occupational therapy should be the keynote of their treatment. Rate aid, voluntary contributions, and "self-help" (by the parents of the children) should be sufficient to maintain the colonies. Too many young delinquents still drifted into prison, and the reasons for this were financial stringency, bias on the part of magistrate or magistrate's clerk, and the dislike inherent in every individual to anyone but themselves putting their house in order. Finance should be dealt with on a basis of everyone doing their share, and bias should be eliminated by making the Home Office suggestions obligatory. The wonderful work done by voluntary effort must not be forgotten. There was too great a tendency to think things impossible before testing their possibility.

Discussion.

Earl RUSSELL agreed that in a great many cases delinquency was not so much a matter of conscious criminal intent as of some physiological, psychological, or environmental factor, and the one thing you should not do with young persons was send them to prison. That idea, however, permeated slowly to the country magistracy. The Home Office suggestions must, however, be administered with intelligence and sympathy, and not as a matter of routine because they were ordered. The best way to convince lawyers that the doctors were not "trying to get the better of them" was to show them the results of sending subnormal cases to suitable institutions.

Dr. T. B. HYSLOP thought on the whole it was worse for a child to be branded as of unsound mind than to be found guilty of an offence. The former was more far-reaching, passing down, as "insanity in the family" to the third and fourth generation, who feared, and indeed anticipated their trouble. The law must come to realise the existence of physiological explanations of offences.

Lieut.-Colonel C. T. SAMMAN said that a hundred years ago we hanged a man for stealing a sheep and now we gave him six months for diabolical murder; we were much too lenient with the juvenile offender. He advocated sterilisation of all criminals.

Dr. W. A. POTTS doubted whether, if all criminals were sterilised, there would be enough of us left to see the result of our experiment. Crime would not be stopped by making it "not worth the criminal's while," for often it was not worth his while already. Juvenile crime might be the result of ignorance and misunderstanding or misleading education. For instance, a child from a very poor home, where all the few possessions were common property, would not understand that the same conditions did not apply at school. A child who had seen its parents take what they liked from a shop, murmuring "Put that down to me," might find it very hard to see the difference when it went and took what it liked itself. Encephalitis lethargica was a very important cause of delinquency, and the initial attack was easy to overlook. The delinquency should not be looked on as an after-result, but as a later manifestation of a condition that was still active and that required full and adequate treatment. The establishment of a juvenile court and a sympathetic magistrate was not going to solve the problem and "get at the mind of the child." That could only be done by heart-to-heart talks in private. It was most important that probation should be conditional and long enough. Young people were not sent to universities for three or six months, and when they had been misled and miseducated all their lives they needed still longer periods for education.

Mr. W. E. CHADWICK spoke of the importance of treating the child in the home at the "difficult" stage before it became delinquent. The real problem was to prevent delinquency and to find some way of teaching parents how to deal with these children.

Dr. R. G. GORDON pointed out that the child who came to the juvenile court was never a "first offender." Parents regarded a child who stole either as amusing or as something too dreadful to talk about. Parents must be taught to seek advice, and if that advice were to be given in the juvenile court there must be a change in its atmosphere. Alternatively there might be some kind of advisory clinic, such as that at Bath, which had proved very successful. The difficulty was almost always a failure of adjustment between the child and society; this ability to adjust was an important part of the personality about which too little was known. Simple mental backwardness was by no means the only cause of delinquency.

Dr. F. C. SHRUBSALL emphasised the difficulty the child had in adapting to town life. We could pick blackberries off a country hedge as much as we liked, but if a child took a blackberry from a basket in town it became a delinquent. There was a hundred times as much juvenile crime in America as in this country, but it was least in the Middle West, where the children lived an outdoor life and had more opportunity for games and exercise. The school and not the court was the place to stop crime; the increasing size of the schools had destroyed the personal contact between master and boys, so the clinic had to take its place. Only 10 per cent. of juvenile delinquency was due to ill-health or abnormality. The real old lag never did anything to corrupt a child; it was the boy a year or two older who was the danger.

Dr. LETITIA FAIRFIELD said that institutions were a very important part of social reform, but they were very expensive. A cheap institution was a nasty institution and would do its inmates no good. You could not make a home from home by calling it a colony, and so long as the child was forced to remain there he would long for home and the fried fish shops. The children were not delinquent because they were subnormal, but because the schools were not adapted to their mentality. The school had to deal with the average. The bright child, who ought to be pushing ahead, was quite likely to become a burglar, but he was better catered for than the subnormal, whose life was one continuous failure and snubbing and hopeless competition. The few gifts—often manual—of the subnormal child had no chance of development because he did not reach standard IV. or V., where there was a manual class. Much could be done to give him a world in which he could be happy if we would cater for him in our educational system. Another way of relieving his lot was through clinics. There was no wish to dodge punishment for children for whom it would do good. There was no kindness to a child in letting it think it could "get away with" crime. But unintelligent punishment had been tried again and again; history was littered with the cruel failures of that system. These children should be treated as we should like to be treated ourselves, and put in a position where they could exercise responsibility. They were struggling with a problem they could not understand and forces they could not control. If law rested on the intelligent consent of the governed the child who had been treated like that would surely be a better citizen and able to give something back to the law.

Lord RIDDELL said that if it was possible to change a child's mind and disposition by proper medical

treatment the first thing was to ensure that such treatment was obtainable, and the general practitioner ought to be trained to deal with these cases.

Dr. E. SLOAN CHESSER emphasised the importance of motive, of the mother, and of decent housing.

Dr. WEATHERLY briefly replied.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

MATERNITY AND CHILD WELFARE GROUP.

THIS group held a meeting at the Royal Free Hospital on Nov. 23rd, Prof. LOUISE MCILROY, the President, being in the chair. A discussion on

ANTENATAL METHODS WITH SPECIAL REGARD TO DISPROPORTION

was opened by Mr. EARDLEY HOLLAND, who said that a weak point about the municipal antenatal clinic was that no beds were attached to it, and the doctor in charge did not look after the women during their confinement, so that an element of irresponsibility crept in. Public health authorities had given great prominence to antenatal work, but far more women lost their lives through lack of care during labour than through lack of antenatal care. The only way to establish a new standard in midwifery was to start with the medical profession, and the only way to do that was to set up more large maternity hospitals. Pelvic measurements had been decried, but they were valuable in giving an early idea of what sort of labour the patient was likely to have, so that everyone could be prepared, if necessary, for induction, Cæsarean section or hospital treatment. Vaginal examination had also been decried, but was important in that it enabled the practitioner to measure the diagonal conjugate and get some idea of the shape of the pelvic outlet. The importance of engagement of the head, on the other hand, had been exaggerated. In some 20 per cent. of primiparæ who had normal labours the head remained floating until the last week or even until the onset of labour. The mere fact of failure to engage was not sufficient evidence of disproportion or difficult labour. Disproportion could not be standardised; it was a matter of personal estimation, depending on an exact mental impression of what was right proportion. The reserve capacity of the pelvis played an important part. The normal pelvis was designed to take a 7½ lb. baby, but in fact it frequently managed a 10 or 11 lb. child by calling up its reserve capacity. Therefore the slightly contracted pelvis might reasonably be expected to manage the 7½ lb. baby.

The treatment of severe disproportion was inevitably Cæsarean section, but for the milder forms two alternative lines might be adopted; induction of premature labour, or test-labour at term and early Cæsarean section if it was apparent that natural delivery was unlikely. Induction was time-honoured, but the speaker said he had come to the conclusion that it was being done too often, since 80 per cent. of induced labours were far too easy. Induction was playing for safety; there were many unknown factors which, if favourable, might allow spontaneous delivery. If the fœtus were premature the doctor must play for safety because the child would not stand difficult labour. Cæsarean section or craniotomy after induction was most dangerous.

Treatment by Test Labour.

In cases of genuine disproportion with a pelvis really contracted the decision was made at the thirty-sixth week, if necessary with the aid of a general anæsthetic. If there seemed a reasonable chance of spontaneous or forceps delivery at term the patient was allowed to go into labour and watched almost every hour. If after a few hours the head began to sink into the pelvis it would pass through; if not, Cæsarean section was performed. The decision required the highest skill and the method was only suitable for institutions with a resident accoucheur of experience. Several secondary factors influenced the decision—e.g., premature rupture, posterior presentation, weak pains, and a nervous or unfit patient would indicate operation. Out of about 2000 deliveries at the London Hospital during the year there had been 17 cases of contracted pelvis, of whom 16 had had test labours. Eleven of these had had spontaneous delivery; three had had easy forceps and two early Cæsarean section. Only one baby had died. There had been no inductions at this hospital for two or three years.

Reducing the Size of the Head.

Dr. ANNIE MCCALL agreed that too many operations were done. She emphasised the fact that disproportion was between two things and there was a tendency to leave the second factor—the head—out of consideration. The size of the head could be altered by dieting the mother. Mothers who had received the advice they ought to have received during pregnancy did not have these enormous babies. During the last month—and preferably two months—the mother should have no protein—i.e., meat, egg, and milk should be forbidden. Milk made fat babies. She should be allowed as much fruit as she liked and should take plenty of hot water, sipping it by the half-pint. Equally important with diet was exercise during the same period. The woman ought to do three or four miles walking uphill daily. Erratic exercise was no good, and hill-climbing brought into play the muscles concerned in labour, which ordinary walking did not touch. Hot baths should be taken on alternate days during the eighth month and daily during the last month. They should be as hot as the patient could bear, and she should sit in them for 13 or 15 minutes. This softened the pelvic floor. Chloral hydrate, with or without bromide of potassium, was invaluable for softening the cervix and shortening the first stage of labour. Dr. McCall preferred to give it every other night for the last ten days before labour, and thought midwives ought most certainly to be allowed to carry the drug, as it saved untold suffering. She quoted statistics from the Clapton Maternity Hospital to show how effective these methods had been, and cited the "hymn" which was given to all the patients there:

> In later months of pregnancy dispense with eggs and meat,
> Then drink hot water freely; take fruit—*all* you can eat.
> Hot baths are very useful, their value is untold;
> These rules, with *daily* exercise, are worth their weight in gold.

Prof. F. J. BROWNE agreed that nothing required so much experience as the estimation of proportion and that the head might float without any pelvic contraction, but thought there was usually some other cause for the floating head—for instance, a posterior presentation or hydramnios. Constipation alone would keep the head out of the pelvis. He was at present quite satisfied with the method of induction; trial labour was not the practice at University College Hospital. He thought that the babies of premature labour often did not survive the first two or three years of life. "Playing for safety" seemed the one thing desirable in conducting a labour. Trial labour was impossible in private practice, but induction caused the doctor, the patient, and the relatives no anxiety and—provided it was not done before the thirty-sixth week—was perfectly safe for the baby. Treatment should never be determined before that week, but by then the head was hard enough to pass without injury through the maternal tissues. Since the date could not be ascertained with accuracy, the accoucheur should estimate the age by vaginal palpation of the head—the width and mobility of the sutures and the general hardness. There were two degrees of disproportion: first, where the head was just flush with the outer margin of the pelvic brim—it would then mould through well—and secondly, when there was definite overlapping, which contra-indicated induction; the case should then go to Cæsarean section at term.

The Significance of the Shape of the Pelvis.

Mr. ALECK BOURNE said that disproportion could only be defined after the baby was born. A case of disproportion produced a white, limp, toneless,

battered infant, with moulded head and large caput, and a perspiring accoucheur holding forceps. This sort of thing happened nearly always in one type of pelvis—the generally contracted. It was by no means the size of the pelvis that mattered most, but far more its shape. The generally contracted pelvis was not a small pelvis of normal shape, but an abnormal pelvis. The measurements were useful in giving an idea of the shape. Where the external conjugate was contracted and the sacrum of normal width, forming a roof over the pelvis, then the pelvis was a flat one and, if only a mild degree of flattening was present (as was usually the case in the south of England), then the head would come through. If all the measurements were reduced and the vaginal finger could feel the whole curve of the sacrum, which seemed to crowd down on the finger, that pelvis would give trouble. He recognised three conditions of the head: floating and refusing to be pushed down, floating and capable of being pushed in, and engaged. Overlapping should be estimated carefully. If it was just the thickness of the symphysis, so that the fingers would slide past it, then the head would come through. If it was overhanging it was dangerous. He was a whole-hearted inductionist; trial labour was impossible in private practice. No opinion should be given before the thirty-sixth week. "Pressing the head down into the pelvis" meant really leaning on the head, with both hands, from the shoulders, for some seconds. If it could not be induced to settle into the pelvis it would not come through, and Cæsarean section was advisable. If it could be pushed in, labour should be induced two weeks later. The error of inducing too early after 36 weeks was very much less than the error of inducing too late and doing an unnecessary Cæsarean section. After the thirty-sixth week an extra fortnight did not matter very much to the baby, always provided the labour was easy. If there was any doubt about the patient's having an easy time she should be induced on her date, and not a day later; *she should not be allowed* to go on from day to day in case she "came off to-day."

Mr. C. LANE-ROBERTS agreed that the date of induction should be settled and adhered to. He had found great benefit from dieting. Attempts to push down the head might fail without an anæsthetic and an enema.

Dr. MARY KIDD asked whether there was any hope of the œstrus-producing hormone providing a satisfactory method of induction. Bougies were impossible in many poor homes and quinine was most unsatisfactory.

Dr. E. H. NASH said that under no circumstances whatever would he allow anyone at an antenatal clinic to advise a midwife to induce labour. It was no part of the midwife's duty or the responsibility of any antenatal officer. It was an encroachment on private practice. Administrators were in great difficulties just now in trying to find the best thing for the mother, the midwife, and the practitioner, and for general peace all round. He had recently been asked at a British Medical Association meeting what specialists were required for at antenatal clinics, as it was work any general practitioner could do. Institutional accommodation was likely to be very limited for many years to come, and students must be taught the method they would have to practise, not what they could do in a hospital with everything at their fingers' ends.

Dr. MARION COCKERELL repudiated the suggestion that the doctor at the municipal clinic was in any way "irresponsible" because he did not see the case through labour. He heard far more about it all than the accoucheur, for he had to see the mother afterwards—with or without the baby.

Dr. AILEEN BOYD MACKAY further emphasised Dr. Cockerell's point and said she had found Dr. McCall's dietary very valuable.

Dr. A. NICOLL asked whether Dr. McCall had had any experience of the health and vitality of the babies after this dieting of the mother, and whether the diet affected the mother's power of uterine contraction and of recovery. She herself reduced the protein, but tried to see that the mother had an adequate diet in other respects.

Dr. H. CHODAK GREGORY mentioned Dr. H. Mackay's work on anæmia in infancy, and asked where the baby was to get its iron reserve from if the mother was deprived of all protein.

Dr. ALAN HAMILTON described a type of illness in the early weeks of life and said how valuable it would be if the pædiatrist knew what sort of labours the mothers of these children had had.

Dr. ETHEL CASSIE said that disproportion must be pretty rare in general practice, and asked whether it would be too Utopian to suggest that the few women who suffered from it should have routine institutional treatment, so that the measures taken for them were uninfluenced by considerations of private practice.

Dr. CHRISTIE BROWN agreed that the average practitioner saw only about 16 cases in a lifetime.

Mr. BOURNE, replying to questions, described investigations of quinine by the hysterogram; the drug, when given in labour, destroyed the even sequence of uterine contraction and substituted for it a series of irregular, valueless contractions. It was quite useless for induction. Œstrin might prove a solution of the problem, but was not yet sufficiently investigated.

Dr. G. C. M. M'GONIGLE spoke of the difficulties of antenatal work among a scattered northern population, often with out-of-work husbands unable to afford doctor's fees. The problem was largely financial, but for the present they must look forward to a large proportion of difficult labours.

Dr. MCCALL said she thought the babies were better for the dieting.

Prof. MCILROY said that it was barbarous to induce before the thirty-sixth week, and she rarely did it before the thirty-eighth. At the Royal Free Hospital inductions were usually at the thirty-ninth week or at term. She taught all her students as if the case occurred in an Irish bog, and not in a hospital. She had found a fair number of funnel-shaped outlets which the measurements of the brim did not reveal. In attempting to test the reserve force of the pelvis they had formulated a satisfactory test of the amount of "give" in the pubic arch. The patient stood on one leg and the examiner's finger under the pubic arch showed the range of its movement. In this way it was possible to know by the end of the pregnancy how the pelvis was going to behave during labour. She deprecated the custom of making the patients work hard during the second stage; they should take as much rest as possible and in this way much post-partum hæmorrhage could be averted. Dr. McCall's hot-water diet, after all, only forestalled the usual treatment instituted as soon as the patient showed any signs of toxæmia.

Mr. EARDLEY HOLLAND said he had pointed out that "trial labour" was only possible in an institution, but the time when most midwifery would be institutional was not far distant. There would be no midwifery salvation in this country until it came.

LEGISLATION ON SMOKE ABATEMENT.—We have already reported (THE LANCET, August 11th, p. 306) that at an inquiry held in July, 20 West Riding local authorities applied for confirmation of a by-law under the Public Health (Smoke Abatement) Act of 1926 with regard to the emission of black smoke from industrial chimneys. The Minister of Health has now replied that he will be prepared to sanction a by-law prohibiting the emission of black smoke for more than three minutes during a continuous period of 30 minutes. After trial of this by-law for three years he will be prepared to consider an application for the restriction to two minutes. The inquiry at Bradford has been regarded as a test, and the applications were the first of their kind under the Act. The by-law for which sanction was sought reads as follows:—

"That the emission of black smoke for a period of more than two minutes in the aggregate within a continuous period of 30 minutes from any building other than a private dwelling-house shall, until the contrary is proved, be presumed to be a nuisance."

Reviews and Notices of Books.

RECENT ADVANCES IN OBSTETRICS AND GYNÆCOLOGY. Second edition. By ALECK W. BOURNE, B.A., M.B., B.Ch. Camb., F.R.C.S. Eng., Obstetric Surgeon to Out-patients, St. Mary's Hospital; Senior Obstetric Surgeon, Queen Charlotte's Hospital. London: J. and A. Churchill. 1928. Pp. 382. 12*s.* 6*d.*

THIS excellent review of progress in obstetrics and gynæcology has found an audience appreciative enough to call for an encore in two years, and the reason is plain. Sound judgment is shown both in the selection of topics and in the manner of their discussion, particularly in the obstetrical chapters. Antenatal care, the outstanding development in modern midwifery; the great and as yet unsolved problem of maternal mortality, and purperal sepsis the largest and most difficult factor in that problem; the causation of fœtal death; antepartum hæmorrhage and eclampsia form the subjects of six out of eight chapters and indicate the scope and practical nature of the book. The chapter on the chemistry of the blood and urine in pregnancy is a sound and judicial effort to appraise the results of biochemical research and coördinate them with clinical phenomena, so as to discover how far they can be relied on in diagnosis, prognosis, and treatment. It is a matter of regret that the author, whose pharmacological work on uterine stimulants is well known to our readers, has not seen fit to include a discussion on the causes of ineffective function in parturition—the most common reason for interference in labour—how they may be obviated and their effects modified by treatment. Recent years have seen more radical changes in principles in obstetrics than in gynæcology, and thus in the second half of the book attention is concentrated mainly on details in treatment, especially new procedures and technique, in the way of surgical operations, X rays, and radium. A new chapter has been added on the operative treatment of prolapsus, in which the methods of the Manchester School, as advocated by the late Prof. W. E. Fothergill, are first described and then the interposition and Mayo operations, the latter being illustrated from Ward's article in the recently published "Gynæcology" by Howard Kelly and collaborators. The scientific side of the specialty is represented by articles on endometrioma and a synopsis of recent work on "Ovarian Hormones," the latter giving a clear and reasonable presentation of a subject in which rapid advance is being made. The technique of radium therapy in cancer of the cervix is, save for a short paragraph on intra-abdominal applications, little altered from the previous edition and perhaps too much confined to the methods used by the author to fit into the scheme of the book as a broad survey of recent work.

For this second edition we predict as warm a welcome as that accorded to its predecessor.

GYNÆCOLOGY AND MIDWIFERY IN THE TROPICS.

Tropical Gynæcology. Clinical Lectures. By V. B. GREEN-ARMYTAGE, M.D., F.R.C.P., Lieut.-Colonel, I.M.S.; Professor of Obstetrics and Gynæcology, Medical College, Calcutta; Surgeon to the Eden Hospital, Calcutta. Calcutta and Simla: Thacker, Spink and Co. 1928. Pp. 249. Rs.3.8.

Tropical Midwifery. Second edition. Same author and publishers. 1928. Pp. 173. Rs.3.8.

THE author of the small volume entitled "Tropical Gynæcology" is well known to gynæcologists in Great Britain as an unusually gifted and enthusiastic teacher. He has given in the form of 11 clinical lectures some of his own experiences and findings in the course of 18 years' work at the Eden Hospital. It is addressed particularly to "new and even old comers in the field of oriental gynæcology, for in this virgin field they will meet with conditions and clinical material that are practically never seen in the West to-day, and for which they may possess no reference or guide in the treatment." The book will, however, appeal to a far wider audience, for it includes chapters on such subjects as disorders of menstruation, sterility, prolapsus uteri, vaginal hysterectomy, and on gynæcological signs and symptoms. The chapter on obstetrics and gynæcology in the East is one of the best in the book, and impresses the reader by the variety of the problems that present themselves to the Indian obstetrician and by the wide differences that exist between practice in India and in England. Thus we read that a severe anæmia of pregnancy of unknown origin is extremely common (56 cases in four years in the Eden Hospital with a maternal mortality of 64 per cent.). Tetany, too, is of frequent occurrence as a complication either of anæmia of pregnancy or of osteomalacia. Eclampsia is common in the wet and cold months, and sufferers from it constitute from 3 to 4 per cent. of all hospital obstetrical cases; while contrary to what is frequently asserted, cancer of the cervix uteri is common and only about 7 per cent. of cases are discovered in the operable stage. To-day many general text-books of midwifery and gynæcology of the smaller type are being published. The time and energy consumed in their compilation would often be more usefully directed to preparing and publishing lectures of the kind before us, in which the writer deals with subjects of which he has had special experience, and can write from first-hand knowledge.

The title "Tropical Midwifery" is perhaps misleading, since the teaching is mainly devoted to the treatment of abnormalities which may be encountered in any climate though a few points of particular importance to those practising in tropical countries are mentioned. The work consists of 22 lectures delivered by the author at the Eden Hospital, Calcutta, and, considering its size, contains an enormous amount of useful practical advice. Prof. Green-Armytage's vast experience of obstetrics in the East has led him to give his own views on the treatment of abnormalities in a concise dogmatic manner. Wherever he disapproves of a recognised form of treatment he gives reasons for his opinion. In India, Cæsarean section gives much better results than induction of labour in cases of contracted pelvis on account of the increased risk of sepsis in hot countries. The lower segment operation has been adopted with success in cases which are potentially septic. The statement that in cases of placenta prævia the great dangers are sepsis and post-partum hæmorrhage is in accord with modern views on the the subject.

The printing and paper are good; perhaps the use of heavy type to emphasise important points is rather overdone. Both of these small handbooks will be welcomed at home as well as abroad by practitioners and students.

SURGICAL DIAGNOSIS IN TABULAR OUTLINE.

By Dr. A. J. CEMACH, Vienna. Authorised translation with additions and notes by EDWARD L. BORTZ, M.D., Associate in Medicine, Lankenau Hospital, Philadelphia, Pa.; Assistant Instructor in Pathology, Medical School, University of Pennsylvania. Philadelphia: F. A. Davis Company. 1928. $12.00.

THIS volume is a translation of a popular Austrian work on surgical diagnosis, and it is claimed that it is the only book of its type in English. The first edition of the Austrian publication appeared in 1914, and the present translation is from the fourth Austrian edition. The aim of the author, and of the translator, has been to deal with the whole subject of surgical diagnosis by means of tables and illustrations, and in this they have succeeded admirably. In some sections of the book this complete tabulation is a disadvantage, since it has made it necessary to provide several very large and complicated tables

It is difficult to see how the author could have avoided such a complication without altering the pattern of his book, and regarded as a whole the tables are excellent. There are altogether 100 of them, 87 dealing with regional surgical diagnosis and the remainder with general surgical diagnosis. The section on general surgical diagnosis is one of the best in the book; it contains clear and concise tables for the differential diagnosis of cutaneous ulcers, new growths of the skin, diseases of bursæ, and tumours of bone. The classifications adopted are entirely satisfactory, and in some cases have the additional merit of being new, thus providing the fresh outlook which is so essential for successful diagnosis. The American nomenclature, which is often quite different from that used in this country, is occasionally hard to understand. The author's meaning is usually obvious, but here and there it is impossible to correlate his expression with our nomenclature.

The illustrations form an excellent catalogue of surgical lesions, so far as these can be represented by pictures, and they are well arranged so that a table and the relevant illustrations can mostly be studied together. The original illustrations were made at the Crown Princess Stephanie Hospital in Vienna, and Dr. Bortz has supplemented them with others from the Lankenau Hospital. The portrayal of exaggerated types of the various lesions has been avoided, and good examples of a moderate degree of the condition illustrated have been chosen. The plates showing swellings of the abdominal wall, the different varieties of hernia, and ulcers of the skin could hardly be improved. It is unfortunate that the muscle selected to show hernia of muscle should have been the biceps brachii; the full-page illustration depicting this condition appears to be a typical example of rupture of the long head of the muscle. It would, however, be hypercritical to dwell on such small matters in a book which abounds in excellent illustrations. The reproductions of radiograms are good, and many clear and well-drawn diagrams are included, also an extensive bibliography.

The book can be recommended to surgeons and to students, for it will supplement the clinical teaching of the ward and out-patient department. It is printed neatly, and the binding is strong and durable.

DISEASES OF THE EAR, NOSE, AND THROAT.

Seventh edition. By WENDELL CHRISTOPHER PHILLIPS, M.D., formerly Professor of Otology, New York Post-graduate Medical School. Philadelphia: F. A. Davis Company. 1928. Pp. 922. $9.

THE new edition of this large work, which is a well-known standard text-book in the United States, is but little altered from the sixth edition, reviewed at some length in these columns (THE LANCET, 1923, i., 804). A chapter entitled the Hearing Problem has been added which deals in a helpful manner with the medico-social problems resulting from deafness. The section on otology occupies very nearly one-half of the volume, and abounds in those details likely to be of assistance to the practitioner. A new feature is a more complete description of the audiometer, which is now being used in the examination of school-children and, to an increasing extent, in consulting-room practice. The remaining portion of the book is divided into sections, respectively, on the nose and accessory sinuses, the pharynx and fauces, and the larynx, with a preliminary section on the influence of general diseases upon the ear, nose, and throat. This section includes tuberculosis and syphilis, with the result that these diseases in the larynx are discussed before the more general problems of inflammation have come under review. The use of the galvano-cautery in the treatment of tuberculous laryngitis receives no mention, although it is now the principal method of local treatment in England; in the chapters on the treatment of laryngeal cancer the operation of laryngo-fissure is still briefly dismissed with the statement that it "can rarely be employed because it is applicable only to cases where the disease is limited to an extremely small area." In this country some considerable degree of success attends the efforts of laryngologists to obtain their cases while the disease is within reach of removal by laryngo-fissure. For the section on otology we have nothing but praise; by comparison with this, the chapters on diseases of the nose and throat show a lack of the practical first-hand knowledge and experience which distinguish the former section.

TECHNIQUE OF LOCAL ANÆSTHESIA.

Fourth edition. By ARTHUR E. HERTZLER. London: Henry Kimpton. 1928. Pp. 284. 25s.

THE present edition of this classical work maintains the high standard of its predecessors, and is enhanced in value by the clearness and accuracy of its illustrations. It is noteworthy that the author is not enthusiastic about splanchnic injection. He quotes Meeker's 42 cases with the need for general anæsthesia in 18, and finds himself that "in conditions with dense adhesions splanchnic blocking does not secure a sufficient anæsthesia." We know no better guide to the use of local anæsthetics than Prof. Hertzler's book.

RENÉ THÉOPHILE HYACINTHE LAËNNEC.

A Memoir. By GERALD B. WEBB, M.D., President, Colorado School of Tuberculosis, Colorado Springs. New York: Paul B. Hoeber; London: Humphrey Milford, Oxford University Press. 1928. Pp. 146. 8s. 6d.

THIS is a reprint, with additions, of an article published in the *Annals of Medical History* (Vol. IX., No. 1, March, 1927) by Dr. Gerald Webb, who was the delegate representing the United States Government at the Laënnec Centenary celebrated in Paris in December, 1926. Rouxeau's authoritative biography in two volumes is, we believe, not easily procurable in this country, so that the present work will be welcome to all medical men who care about the history of their science. Laënnec had few advantages; his mother died while he was quite a boy, his spendthrift father married again, and his second wife did not take any interest in her stepson. Of feeble health, René Laënnec was subjected to grinding poverty through all the early part of his life; he did not get enough to eat and he lacked proper clothing. In his early years he was much helped by his uncle, Guillaume-François, the physician of Nantes, and his own hard work brought its reward. It is surprising that he accomplished as much as he did, for he died at the age of 45 years.

The invention of the stethoscope in 1817 and the publication of "De l'Auscultation Médiate" in 1819 brought Laënnec prominently before the profession. His work was adversely criticised by his contemporaries in his own land and progress was slow; but in spite of ridicule at home the reputation of the author quickly spread abroad, and foreign physicians crowded to Paris to hear Laënnec before his untimely death in 1826.

The book is well printed and is enriched with 13 full-page plates.

MOTHER AND CHILD.

By MARY LYON. London: A. and C. Black, Ltd. 1928. Pp. 215. 5s.

THIS unpretentious little volume is designed for the use of mothers of the more educated classes. Mrs. Lyon, though not herself a medical woman, has founded her advice on the teaching of such experts as Dr. Eric Pritchard and Dr. Hector Cameron. Her book, which deals with the care of the child from its antenatal days up to adolescence, contains abundant hints of the most practical kind. The usual subjects—antenatal care, feeding, baths, exercise, weaning, and so on—are dealt with, but the author has managed to give her book a personal

character. Physical and psychical problems are discussed side by side with wisdom and sympathy, and the guidance offered should enable the mother to ensure for her child a greater degree of nervous stability than is often found in the product of modern nurseries. The least satisfactory chapter is that dealing with the infections of childhood; while the subject of measles, its recognition and nursing, is excellently presented, that of diphtheria is incomplete and even misleading, as, for example, the statement that "diphtheria, as everyone knows, is a severe sore-throat to begin with." Faucial diphtheria in young children is apt to be extremely insidious in its onset, the first symptoms usually being general rather than local, while in laryngeal and nasal diphtheria "sore-throat" may be entirely absent. The danger of paralysis and early cardiac involvement is not mentioned, or the necessity for prolonged rest in bed. With regard to rubella, the statement is made that infection lasts for a month, so that quarantine for this period must be maintained. Isolation for a week is all that is now usually considered necessary. In scarlet fever the desquamation is no longer regarded as a probable carrier of infection. Apart from these small points the work is admirably conceived and carried out, and should attain a well-deserved popularity.

JOURNALS.

AMERICAN REVIEW OF TUBERCULOSIS, July, 1928.—Dr. Edward N. Packard contributes an article on Massive Collapse of the Lungs. Cases of atelectasis fall into four groups: (1) those complicatory diphtheritic paralysis of the diaphragm; (2) following operations or wounds; (3) caused by obstruction to a bronchus by foreign body or tumour; (4) associated with chronic pulmonary disease, especially tuberculosis. The condition is characterised by an abrupt onset and with symptoms of acute pulmonary distress there are signs of consolidation and retraction of the affected lung. Recovery may be rapid but pneumonia supervenes in some instances. The treatment is symptomatic. Cases are described in which the condition was associated with bronchial stenosis secondary to fibroid phthisis and enlarged hilar glands.—Dr. Allen K. Krause writes on the Laboratory Diagnosis of Pulmonary Tuberculosis. After reviewing past efforts to discover a reliable test for active tuberculosis by the use of tuberculin, by examinations for opsonins, aggressins, precipitins, and lysins, by complement-fixation tests and Arneth's blood count, he concludes that no laboratory procedure can at present carry the whole load in the positive diagnosis of tuberculosis. The results of Pirquet skin tests and of sputum examinations are of the utmost value if discrimination be used, but the fallacies attending the former are well known, and even a positive sputum test may "accompany a tuberculous condition that cannot be conceived of as active by any functional standards." Of all tests that of the sputum is, however, the most important, and repeated examinations are urged in all doubtful cases. When inoculating guinea-pigs with sputum the subcutaneous route in the groin is preferable to the intraperitoneal. It is not true that all adults react positively to tuberculin, despite the results of experiment in Vienna in 1915, which are not applicable to America in 1928. The intradermal or Pirquet test should be employed whenever tuberculosis is suspected, for a negative finding has a positive significance. Examination of the blood is also of value, for tuberculosis has comparatively small effect on the blood cells. A rapidly progressing anæmia suggests some other infection or malignant disease.—In the August number Dr. Carl R. Howson, of Los Angeles, describes the physiological anatomy of the normal thorax and the physiological mechanics of the chest as altered by artificial pneumothorax, and includes a study of the respiratory movements, costal, respiratory, and diaphragmatic in a case of severe pulmonary tuberculosis treated by complete collapse of a lung. This lengthy article should be read by all who are interested in collapse therapy.—The greater part of the September issue is devoted to a consideration of tuberculosis in its relation to public health.

New Inventions.

FORCEPS TO SIMPLIFY RAMMSTEDT'S OPERATION FOR CONGENITAL HYPERTROPHIC PYLORIC STENOSIS.

IN performing Rammstedt's operation undue delay and increase in shock are frequently caused by the intestine and omentum protruding from the wound. This protrusion is due to the size of the incision necessary for the fingers to grasp the pylorus and to the light anæsthesia of gas and oxygen, which is the anæsthetic of choice. To eliminate these difficulties and simplify the operation I have devised a special pair of forceps here illustrated. These forceps have

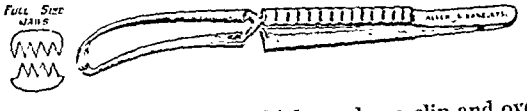
their grasping ends shaped like a pair of midwifery forceps and are lightly constructed to prevent any harm being done to the tissues. The handles are fitted with a ratchet, the first teeth of which lock before the grasping ends are in contact, the other teeth taking purchase as the forceps are closed. In this way the varying size of the hypertrophied pylorus in infants is allowed for. The forceps are made with a curve to allow the handles to lie flat on the abdomen when the pylorus is pulled up into the wound. With this instrument the peritoneum need only be incised sufficiently to admit one finger which is passed down to the pylorus. The forceps held in the other hand are then passed along the finger to the pylorus, which is grasped and pulled out through the wound. No other tissue has an opportunity to protrude. When the pyloroplasty is completed, the pylorus is allowed to drop back and the incision in the abdominal wall closed.

The forceps have been constructed for me by Messrs. Allen and Hanburys, Wigmore-street, London, W. 1.

GEORGE D. F. MCFADDEN, M.B., M.Ch. Belf., F.R.C.S. Eng.

TONSIL-HOLDING VULSELLUM FORCEPS.

HAVING had considerable difficulty with the clip of other tonsil-holding forceps, made so as to allow a guillotine or snare to be passed over them whilst holding the tonsil, I have had made a cross-action



spring vulsellum forceps which needs no clip and over which a guillotine can easily be passed while the tonsil is pulled out of its bed. In practice I have found this vulsellum to work well, provided the spring is made sufficiently strong. There being no clip to get out of order, this type is more simple in its action than the other types previously used, and is useful in both hospital and private practice.

The apparatus is made by Messrs. Allen and Hanburys, Ltd., of Wigmore-street, London.

C. A. SCOTT RIDOUT, M.S., M.B. Lond., F.R.C.S. Eng.

THE LANCET.

LONDON: SATURDAY, DECEMBER 1, 1928.

THE KING'S ILLNESS.

FOR the past ten days the KING's illness has been causing very natural anxiety both at home and abroad. Though no official announcement was made until Wednesday, Nov. 21st, it is understood that he had not been in quite his usual health since the previous Saturday. Returning to town from Sandringham on Monday, he held a Council on the following morning and was able to carry out other engagements before seeking medical advice. Sir STANLEY HEWETT found him suffering from a feverish cold and called in Lord DAWSON on the next day. The KING was confined to bed but the fever persisted, and by Thursday there were signs of congestion of the right lung. At this stage Dr. L. E. H. WHITBY, of the Middlesex Hospital, attended at the Palace in order to ascertain what organisms were responsible for the infection, and on Friday radiograms of the chest were taken by Dr. GRAHAM HODGSON, of King's College Hospital. That evening a slight improvement was noted, and this was maintained on Saturday. Inflammation of the pleura was a conspicuous feature of the clinical picture, but the patient kept up his strength, and there were restful intervals; the temperature falling below the figure of 101° F. which had been recorded on Thursday night and Friday morning. A return of higher fever on Sunday inevitably resulted in sleeplessness and discomfort, and on Monday the public was warned that further spread of the pleurisy might be expected. Up to the time of going to press, however, there has been no considerable change in the physical condition, and a certain amount of rest has been secured. This is of great importance. Specific treatment is a useful aid, and may possibly turn the fortunes of the day, but it cannot put the infection to sudden rout. The last ten years have made us familiar with pulmonary inflammation whose course is inconstant, one phase developing after another. How long each phase will last is always the anxious question, and in the present case a certain amount of reassurance can be gained from the published records of temperature, which we read as indicating some curtailment of the forces of infection. At the same time it would be idle to pretend that an illness of this kind in a patient over 60 is not serious. The statements of the official bulletins have been informative though restrained, and a medical man reading them consecutively can form a picture of the illness and its course. That they may give us an increasing confidence in HIS MAJESTY'S recovery is the earnest hope of all his subjects.

SUSCEPTIBILITY TO CANCER.

WE have been accustomed hitherto to look upon cancer as a disease which at its inception is conditioned entirely by local factors. The work of the last few years on the experimental production of cancer is in accord with this view. Thus when the skin of mice is subjected to chronic irritation by tar painting the cancer develops at the site of skin where tar painting has been applied. But as happens so often in cancer research further investigation has brought to light an entirely unexpected aspect of the problem, which tends to complicate it. The local response of the tissue subjected to chronic irritation appears to be influenced by general systemic factors which may either accelerate or delay the cancerous development. The existence of such general factors was first brought to light by Dr. J. A. MURRAY in an experimental investigation in which he subjected mice to successive courses of tarring. When a mouse is subjected to tar painting cancer will develop in a few animals after four months, in a larger number of animals round about the sixth month, some mice will develop cancer only after a much longer period of tar painting, eight, ten, or even 12 months, while in a few no cancer appears. One may say, therefore, that there are variations in the resistance, or if one prefers the converse term in the susceptibility of individual mice to carcinogenesis by tar painting. The experiment itself does not make it clear whether these differences in susceptibility reside in the skin itself or are due to general systemic factors. But at any rate it may be supposed that a mouse which has developed a cancer within six months of tar painting is a susceptible animal. One would assume, therefore, that such a susceptible animal, if subjected to a second course of tarring after the first tar cancer has been removed by operation, would again respond to this chronic irritation by the development of a second cancer within a similar period of time. But the experiment gave exactly the opposite result; these mice failed to develop cancer in response to a second course of tarring. It is not necessary that the first cancer should be a cancer of the skin or that it should have been produced by tar. Mice suffer frequently from spontaneously developed carcinoma of the mamma. Such mice are therefore susceptible to the development of cancer. If such mice, after operative removal of the growth, were subjected to a course of tarring it was again found that these mice failed to respond to this chronic irritation by the development of a tar cancer. This experimental demonstration of an inhibitory influence exerted by the development of a first malignant new growth on the subsequent development of a second neoplasm throws light on certain curious and hitherto unexplained features of cancer as it appears in man. In his Linacre Lecture on Multiple New Growths,[1] Dr. MURRAY pointed out that the extraordinary rarity of multiple malignant new growths of different organs or tissues could be accounted for in this way. An even more interesting application is given by him in the annual report of the Imperial Cancer Research Fund [2] which has been issued this week.

In this country and in a number of other countries in which trustworthy cancer statistics are available—Dr. MURRAY has chosen England, Holland, Switzerland, and Japan—the total incidence of cancer is about the same for the male and for the female sex. Now in this country approximately 30 per cent. of

[1] THE LANCET, 1927, ii., 800.

[2] Twenty-sixth Annual Report of the Imperial Cancer Research Fund, 1927–28. Offices of th Fund: 8–11, Queen-square, London, W.C.

the total mortality of cancer among women is due to cancer of the breast and uterus—i.e., organs peculiar to the female sex—while the organs peculiar to the male sex show a very low incidence of cancer. One would expect, therefore, to find that the total incidence of cancer in men is considerably lower than that of women. But, as already stated, it is approximately the same, because in men the organs common to both sexes are more frequently affected by cancer than in women, and this greater frequency is of such a degree that it equalises the frequency with which the breast and uterus are the seat of cancer in women. The same relationship is found to exist when the incidence of cancer in men and women for each of the other three countries mentioned is examined. The same phenomenon appears again when a comparison is made between the incidence of cancer among women of the four different countries. In this country, as we have seen, cancer of the breast and uterus represents about 30 per cent. of the total incidence of cancer in women. The frequency with which breast and uterus are affected is about the same. In Holland both cancer of the breast and cancer of the uterus are only half as frequent as in England. Switzerland takes an intermediate position. In Japan cancer of the breast is a rare disease. Here again we would expect a corresponding difference in the total incidence of cancer among women of these four countries, and again we find that the total incidence is approximately the same. Dutch women suffer more frequently from cancer of the digestive tract than English women, while Japanese women suffer more frequently from cancer of the uterus. The higher incidence of cancer in one organ—or group of organs—so nearly balances the lower incidence in another group that the total incidence among the women of the four different countries is almost the same. In Dr. MURRAY's report these remarkable statistical relationships are represented very clearly in a diagram which those interested in the subject are advised to study. Instead of regarding the development of cancer in any particular organ as an independent phenomenon, unrelated to the development of cancer in other organs, and instead of looking upon the total incidence of cancer as merely the sum total of all these unrelated processes, this diagram now presents us with an entirely different picture. It would now appear as if the total incidence of cancer were determined by the susceptibility to cancer and that within that compass the different organs are affected by cancer either according to their special organ susceptibility or according to the extent of the various carcinogenic factors of chronic irritation which are allowed to act upon them.

This difference in outlook can best be illustrated by an example. The higher frequency of cancer of the digestive tract in men has been attributed to the more strenuous lives that men are supposed to lead so that they are supposed, for instance, to eat their food hurriedly, and partly to their habits of smoking and drinking. The explanation is obviously made ad hoc and has never been very convincing. It is, moreover, no longer true to-day, when a large number of women have exchanged the alleged leisure of keeping house for a business career and when smoking and drinking have ceased to be a privilege—or vice—reserved for the male sex. According to the susceptibility theory women suffer less frequently from cancer of the digestive tract, because among women susceptible to cancer a large number develop cancer of the breast and uterus and pro tanto diminish the number of those who could develop cancer of the digestive tract. Another illustration is afforded by a recent investigation into the incidence of cancer of the breast in Holland and in this country. As already stated, cancer of the breast and uterus is almost twice as frequent among English women as it is among Dutch women. A committee of distinguished statisticians and pathologists appointed by the Health Committee of the League of Nations has carried out an exhaustive investigation into the various possible factors which might conceivably be responsible for this difference, but nothing could be found to account for it. The investigation was so careful and comprehensive that this negative result can be accepted as a positive contribution to our knowledge; it makes it unlikely that there are any external factors which render Dutch women relatively immune to cancer of the breast and uterus. But since in Holland both sexes suffer more frequently from cancer of the digestive tract than the corresponding sexes in England, it seems probable that the habits and conditions of life in Holland predispose to this latter form of cancer and since of the susceptible women in Holland more are affected by cancer of the digestive tract, a correspondingly smaller number is left over in which the breast and uterus may develop cancer. At first sight such a conception would appear to offer a very dark outlook introducing the cold-blooded conception of "effectual calling" of Scottish theology into the realms of pathology. Supposing it were possible by local methods to diminish the incidence of cancer in any particular organ, say, cancer of the uterus, then, if this view held good, there would be a corresponding increase in cancer of some other organ. But, as Dr. W. CRAMER has pointed out in two recent papers,[3] there is a brighter side to it. If there is such a thing as susceptibility it must depend on general systemic factors which can be investigated experimentally and which may be capable of being influenced. Already it has been shown that susceptibility is not a fixed condition, but that it can be raised and lowered. It is a new way of looking at the cancer problem and, if further progress along these lines is made, it may be possible to increase the resistance to the development of cancer.

THE MEDICAL PROFESSION'S PART IN LEGISLATION.

WHEN a Member of Parliament is chosen to be president of the Epidemiological Section of the Royal Society of Medicine, it is appropriate that his presidential address should examine the processes by which the ideas of the medical profession can obtain legislative effect. There are 13 medical Members of the House of Commons; what can they do to initiate and mould new laws? In answering this question Lieut.-Colonel FREMANTLE's presidential address does not overrate the powers of any private Member of Parliament. The private Member can help to form public opinion outside as well as inside the House. By legitimate propaganda at question-time he may focus attention upon some needed reform. By sedulous work in committee or by using some scanty opportunity in debate, he may have the chance to indicate an amendment or to interpolate a new clause. He may even draft a whole Bill which will be officially printed and may thus arouse public notice. With the luck of the ballot he may actually find himself expounding his own proposals on some Friday evening. The Government's time-table for

[3] Systemic Factors in the Genesis of Cancer, Brit. Jour. Exp. Path., 1926, vii., 1; Ergebnisse und Ziele der Krebsforschung, Zeitschr. f. Krebsforschung, 1928, xxvi., 194.

the session may block the private Member's chances; but, on the other hand, the Ministry of Health may be glad to see some topic unofficially brought forward; many a useful measure may begin its life as a private Member's Bill, and, on subsequent adoption by the Government, may receive the added facilities which the appropriate Department's blessing will confer. Examples of such Bills in recent years have been those dealing with births and deaths registration, maternity and nursing homes, and mental deficiency. Yet nowhere, either among Government proposals or private Members' Bills, do we find measures for the embodying of the Lunacy Report recommendations or for giving effect to the Voluntary Hospitals Committee Report, or the more recent Report of the Vaccination Committee. Here are medical subjects which our medical Members seem powerless to push forward. They speak in Parliament with the confidence of acknowledged experts; their speeches are published abroad; their interest in health matters is conspicuous; yet somehow the necessary impetus from outside the House is lacking. How is public support to be mobilised? How is the authoritative voice of the whole medical profession to be heard? Even the small band of medical Members can hardly be drilled to team-work. They represent their constituencies, not their profession. They were sharply divided, for instance, over the compulsory notification proposals in the Edinburgh Corporation Bill last session. And, as they enter Parliament as members of a political party, we cannot be surprised if their divisions follow the lines of party politics. For better or for worse the country is wedded to the party system; the Whips expect obedience; the machine of ministerial legislation cannot be operated unless definite calculations can be made of support and opposition. Left to a free vote—as in the debate upon the Prayer Book—the running of the machine is incalculable.

Seen historically (and Dr. FREMANTLE rightly insists on the value of history in the study of public health), our national tendency in legislation is to proceed from the particular to the general. English criminal law is full of statutes which have followed some specific incident or decision in the police-court or at assizes. Similarly, in the domain of health legislation, a famine or a cholera epidemic has more readily stimulated our law-makers than any abstract study of theoretic reforms. Being a practical people, we legislate ad hoc. Perhaps it is the misfortune of medical ideas that they seem too much the affair of experts. Yet Parliament will give the experts a free hand upon occasion. How many Members of Parliament perused the immense Bills which reformed conveyancing and the law of property in 1925? How many understood what they read? Our preference for concrete piecemeal legislation happens to have its happiest illustration in the field of public health, where Parliament has so often allowed the trying out of an experiment locally and subsequently has applied the new law to other areas or to the whole country if the experiment has proved successful. We like to follow legislative precedents; we prefer the empiric method to philosophic theory. Moreover, the policy of proceeding area by area is in harmony with our traditions of local self-government. It is the sensible principle that those who feel the pinch of the shoe shall themselves correct what is amiss. If we want to have a healthy nation we must work for sound local government. Central guidance, help, and stimulus are necessary, but it is the local impetus which will make the progress. If our medical Members of Parliament can be satisfied that the new Local Government Bill conforms to this principle and aims at sound local government rather than a colossal bureaucracy, they may find themselves able to support it with enthusiasm and with concerted counsel as the representatives both of their constituencies and their profession.

Annotations.

"Ne quid nimis."

VOLUNTARY HOSPITALS AND MOTOR ACCIDENTS

THE report[1] on voluntary hospitals, which has just been issued by Mr. R. H. P. Orde, director of the Central Bureau of Hospital Information, is practically complete, for it envisages over 99 per cent. of the total voluntary hospital bed accommodation of Great Britain (exclusive of London). The actual number of hospitals reviewed is 755, of which 75 per cent. show credit balances, giving welcome evidence of recovery from the previous bad year. In spite of adverse trade conditions, the total of workmen's contributions reached the highest figure yet attained. One of the features in this valuable report is a symposium on the difficulties experienced by hospitals throughout the country in dealing with road accident cases. It is common knowledge that during the past few years these accidents have greatly increased and many hospitals, especially those on the main lines of traffic, have with difficulty been able to provide beds and treatment for the injured, whether motorist or pedestrian, without encroaching on accommodation already too limited for the locality in which they are situated. The report summarises 98 replies, received from 160 provincial hospitals, to letters asking for information regarding the volume of work and the cost involved in treating such cases. From these replies it is deduced that the hospitals treated during the year 1927 approximately 26,000 in-patients and 39,000 out-patients as a result of motor accidents, at a total cost of £230,000, the amount received by the hospitals from insurance and from the patients themselves towards their cost being only some £26,000. The records, although incomplete, justify a belief that these figures are a reasonable approximation to the truth. Only one of the hospitals sending in returns has received as much as one-half of the cost incurred; 10 have received nothing at all; probably 11 per cent. represents fairly the amount which the majority of the hospitals recover by gift or payment. A factor in the problem is the unevenness with which the burden falls on different hospitals. Two hospitals on the outskirts of London, with 112 and 52 beds respectively, treated 164 and 100 in-patients, while a Midland hospital and a north country hospital of 124 and 140 beds treated only 62 and 36 in-patients. None of the steps taken appears to have adequately met the situation. In one hospital patients are interviewed and a written undertaking obtained to include hospital costs in any claim made. In another patients are asked whether they are making claims for compensation, and sums varying from £5 to £70 have been received. In a third each patient, on discharge, has been given a bill for the full cost of maintenance, with a view to his passing it on to the person who caused the accident. An obvious difficulty is due to the large proportion of patients who do not belong to the district in which the hospital is situated; in a small hospital with a limited area the proportion may be as high as 33 per cent., while in a city hospital serving an extensive county area it may be as low as 3 per cent. Many people think that the solution of the

[1] The Voluntary Hospitals in Great Britain, excluding London. Ninth Annual Report for the Year 1927. Published by the Central Bureau of Hospital Information under the auspices of the British Hospitals Association and the Joint Council of the Order of St. John and the British Red Cross Society, 19, Berkeley-street, London, W. Pp. 128. 1s.

problem is to be found in the compulsory insurance of motorists, but Sir Arthur Stanley, in his presidential foreword, remarks that this method has been carefully examined and does not appear to be practicable, if only for the reason that many of the persons involved in road accidents are not themselves motorists. Sir Arthur expresses his personal hope that motorists themselves will come to the rescue by establishing some central voluntary fund from which the hospitals could be helped. Articles contributed by Lord Montagu of Beaulieu and Sir William Goschen also point out the difficulties in solving the problem by insurance alone. While nothing should be done to alienate the practical sympathy of the voluntary giver, it is clear from the views expressed in reply to the questionaire that some extension of voluntary hospital support is necessary in order to enable hospitals to meet the cost of treating patients suffering from road accidents.

NUTRITIONAL ANÆMIA IN INFANCY.

AN investigation extending over the last three years and comprising nearly 800 cases with 3000 hæmoglobin estimations has been made by Dr. Helen Mackay, assisted by Miss Lorel Goodfellow, and has revealed the prevalence of anæmia among London infants. Discussing her results at the Section for the Study of Disease in Children of the Royal Society of Medicine on Nov. 23rd, Dr. Mackay said that the anæmia was largely nutritional in origin and was due to a deficiency of iron, possibly associated with other factors. It is known that an infant obtains its iron needs not only from milk, which is poor in iron, but also from a store in the liver, and it seems likely that this store may be unduly low in many London infants. The hæmoglobin level of new-born infants has been shown by many observers to be over 110 per cent. at least. The average hæmoglobin percentage in the blood of fairly healthy artificially fed London infants shows, according to Dr. Mackay, a sharp fall from this high level to about 65 at the age of 2–3 months, a rise to about 70 at 5–6 months, and then a steady fall, reaching about 65 when the child is a year old. The continuous administration of iron, starting when the infant was less than 2 months old, raised the average hæmoglobin percentage to about 80 by 4 months old and onwards. Twins, premature infants, and other infants whose birth weight is under 6 lb. are specially in need of iron treatment. The selection of the iron salt is of importance; iron and ammonium citrate proved effective. The salt used contains a trace of copper, but it is not known whether this had any influence on the results produced. The iron was satisfactorily administered on a large scale by incorporating it in a dried milk.[1] No evidence was obtained that want of light is an ætiological factor in anæmia in infancy, and artificial light therapy did not cure it. No vitamin deficiency appeared to be involved. The value of liver treatment is still under investigation, but the results so far obtained can be explained on the assumption that liver treatment is efficacious only because it provides a source of iron. The routine administration of an iron salt to artificially fed infants is advocated by Dr. Mackay on the ground that, by preventing the anæmia from which most of them would otherwise suffer, it would raise the level of health of our infant population.

[1] This was supplied by the "Cow and Gate" firm, who have now placed it on the market under the name of Hemolac.

THE CLASSIFICATION OF PNEUMONIA IN CHILDREN.

THE differential diagnosis of the various types of pneumonia encountered in early life is admitted by experts to be a matter of some difficulty, not only because mild cases exhibit very few physical signs but also because lobular types ending in crisis and rapid recovery are very difficult to classify, even when physical signs are well marked. When it is agreed that the prognosis of the various types of pneumonia differs considerably it is clear that exact diagnosis is a matter of great importance, but examination of statistics derived from large numbers of cases shows that the personal factor amongst clinicians must give rise to serious difficulties in the diagnosis of these diseases. Thus Heiman, reporting on 215 cases, found the relation of lobar to broncho-pneumonic cases to be 1–17, whereas Pisek and Pease in 550 cases found the relation to be 1–2, and Morse in 178 cases gives it as 2–1. All these figures were derived from children during the first two years of life. When the statistics are taken from somewhat older cases we find series such as those of Heiman of 336 cases below the age of 6 in whom the relation of lobar to broncho-pneumonia was 1–6, and Holt dealing with 370 cases up to the age of 4 gives the relation as 1·0–0·4. It would seem clear from these figures either that the variety of pneumonia in children changes with locality, or that diagnostic inaccuracy is much more prevalent than is desirable. The latter explanation is suggested in a paper[1] by Dr. J. P. Crozer Griffith, of Philadelphia, who has made a combined study of the clinical, radiological, and post-mortem findings in 26 fatal cases under his care. Particular attention was paid to securing the highest possible degree of accuracy in diagnosis in these cases, and the post-mortem diagnosis may be accepted as correct. There can, indeed, be no other final criterion. Unhappily for the peace of mind of both clinician and radiologist there were only six cases in the 26 in whom clinical and X ray study both yielded accurate diagnosis. In ten cases only were the clinical and X ray diagnoses in agreement, and of these ten the diagnosis was wrong in four cases. Examining the matter from a different angle, the clinical diagnosis was correct in 15 of the 26 cases and X ray diagnosis correct in only 12, but it must not be supposed from this that the X ray diagnosis was without value because six cases were accurately diagnosed by this method which had been wrongly classified by the clinician. In discussing this paper Dr. Griffith emphasises the fact that in addition to the two main groups of broncho- and lobar pneumonia all clinicians recognise certain subtypes, but until more precision can be obtained as to which of the two main groups a case should be placed in, it seems unwise to make any attempt at finer diagnosis.

THORACOPLASTY IN PHTHISIS.

THE late results of thoracoplastic operations are the subject of a paper[2] by Dr. Morten H. Gjessing, assistant to Dr. O. Tandberg, of the communal hospital in Lillehammer. Their material consists of 103 cases of pulmonary tuberculosis treated by extra-pleural thoracoplasty between August 13th, 1920, and Feb. 15th, 1928. The first 26 operations were performed under local and the remainder under general anæsthesia. In every case a pneumothorax had been attempted or put out of court because the X ray picture had indicated such extensive adhesions that this treatment seemed unfeasible. In eight cases the thoracoplasty supplemented an already existing partial pneumothorax. The operation mortality was 8·7 per cent., nine patients having died immediately or soon after the operation. Seven other patients died in the course of the following year. A classification of the operation deaths according to sex and the side operated on brought out the facts already demonstrated by Sauerbruch and others that the mortality is much higher in men than in women and for operations on the right side than for those on the left. Thus, there were seven operation deaths out of 45 right-sided cases, whereas there were only two operation deaths among the 58 cases in which the left side was operated on. Again, there were seven operation deaths among the 45 male patients, whereas there were only two such deaths among the

[1] Jour. Amer. Med. Assoc., 1928, xci., 1331.
[2] Norsk Magazin for Laegevidenskaben, September and October, 1928.

58 female patients. It would seem that this combination—male patient with operation on the right side—entails the remarkably high operation mortality of about 25 per cent. After discussing the anatomical and physiological differences in the two sexes which may account for this curious phenomenon, Dr. Gjessing gives the following analysis of the late results of thoracoplasty. Of 88 patients observed for from one to seven and a half years after the operation, 36, or 40·9 per cent., were fit for work, 14 were partially fit for work, 6 were better but not fit for work, 4 showed transitory improvement, 2 showed no change, and 26, or 29·5 per cent., were dead. As might be expected, the mortality in this class of case is highest during the first three years after the operation, and of the 52 patients with an observation period of three to seven and a half years since the operation 20 were fit for work, 6 were partially fit for work, 3 were unfit for work but better, 1 showed temporary improvement, and 22 were dead. In other words, more than 50 per cent. of the patients selected for this operation derived lasting benefit from it. Dr. Gjessing finds it useful to put the phrenic nerve out of action, and concludes with an appreciative discussion of exairesis as a measure supplementary to thoracoplasty.

AVERTIN ANÆSTHESIA.

AVERTIN has now been used for rectal anæsthesia over 100,000 times in Germany, but its "advantages are not yet finally determined on a basis of security" according to Prof. V. Anschütz who contributes a valuable article[1] on the subject. Regulation of the dosage is, of course, the great obstacle to invariable success with this as with other anæsthetics administered per rectum. The usual method of putting in the entire estimated dose within a few minutes has given at Kiel success in 80 per cent. of the cases. The alternative procedure of feeling the way, so to speak, and giving the injection by fractional administration requires so much time and patience that it does not appear to be a practical proposition. Prof. Anschütz forbids any enema on the morning of operation so as to avoid risk of irritating the rectal mucosa and of leaving water behind, which would, of course, upset the proper strength of the injected avertin solution. He uses an airway, leaving it in position till the patient awakes, sometimes for hours at a stretch. Prof. Anschütz regards avertin anæsthesia as the method of choice in elderly patients and in the presence of pulmonary, aortic, or renal complications—"in a word, in all cases where ether anæsthesia is contra-indicated."

HOSPITAL BEDS IN THE SHEFFIELD AREA.

IN our issue of Oct. 27th appeared a short paragraph entitled Overcrowding at Sheffield Infirmary, which suggested so serious a shortage of hospital accommodation in Sheffield, that beds had to be made up on the floor, and that there was a long waiting list of medical and surgical cases. The information, received from a trusted correspondent, which was embodied in this paragraph, did not seem to us improbable, since the fact of shortage of beds and overcrowding is only too true of some other hospitals in the area, and was the occasion of the recent decision in favour of a system of coöperation and coördination between the hospital authorities of the district, with Sheffield as the pivot of the scheme. But we have been informed, and have already taken occasion to declare, that the information did not refer to the Royal Infirmary, Sheffield (or indeed to any other hospital in that town), and we sincerely regret any trouble or annoyance which it may have given to the hospital authorities there. The area of shortage of accommodation, which has a radius of some 25 miles, includes Barnsley, Mexborough, Doncaster, Denaby, Rotherham, Worksop, Retford, Bakewell, and Chesterfield. The scheme includes four Sheffield hospitals with a total of 1067 beds and eight hospitals outside with about 700 beds, the autonomy of which will be in no way affected. A regional conference a few months ago reported that in the Sheffield area there were more than 2000 and in the outside districts another 1000 patients needing hospital treatment but unable to be accommodated. At the same time the poor-law institutions had vacant beds in the areas of Sheffield, Doncaster, and Worksop. The attribution to Sheffield of the hospital shortage which exists elsewhere is the more regrettable inasmuch as Sheffield has made great efforts to supplement its accommodation for the sick, the number of beds in the local hospitals having increased by 320 during the last eight years. This excellent increase has been facilitated by the success of the penny-in-the-pound scheme which last year brought in a sum of more than £110,000. In Doncaster the rapid increase of the industrial population, owing to the development of coal-mines in the immediate vicinity, has outgrown the hospital accommodation. Traffic emergencies claim more and more of the beds allocated to accidents in the collieries and other industries. In the last six years the number of beds at the Royal Infirmary has advanced from 65 to 121 and every temporary measure has been taken to meet the shortage. The daily average number of beds occupied was in fact 117·5 for the year ended Sept. 30th. Last May work was commenced on the first block of a new infirmary which will be ready for occupation in the autumn of 1929; this will provide 150 beds at a cost, including the new nursing staff accommodation, of £70,000. The industrial situation has led to difficulties in the project, but colliery owners, glassworks, and other firms have offered timely help. A complete new hospital of 300 beds at a cost of £300,000 is the ultimate objective.

ENUMERATION OF NEMATODE EGGS.

AN instance of inter-reaction between medical and veterinary practice is seen in H. O. Monnig's[1] attempts to apply to sheep's fæces certain counting methods which have been used for enumerating nematode eggs in human fæces. He originally employed a technique in which straining through a series of sieves followed by sedimentation for ten minutes had given inexact results. Since straining through a single sieve has been found in a particular series of experiments to remove on the average not less than 60 per cent. of human hookworm eggs, and since the further loss of eggs which will occur on decantation after sedimentation by gravity for ten minutes is unknown, these irregularities are easy to understand. When this method failed he tried the Hamburg coverslip counting technique, as employed on dog's fæces by Hung[2] in Fülleborn's laboratory. This is a gravity floatation method which samples a known fraction of the surface of the vessel in which floatation is effected. It was checked by Hung against Stoll's technique and against one which was Lane's direct centrifugal floatation (D.C.F.) in name and in principle, but in none of the details essential for success. Monnig found the Hamburg method to fail, when applied to sheep's fæces, by reason of the amount of floating grass which obscured vision. This confirms a finding, not generally known, that when Fülleborn used the method upon human material for egg-counting in an Argentine hookworm campaign, he found he could not rely upon it. Monnig did not use D.C.F. pushed to finality since he believed that here, too, the amount of float would prevent accurate counting. He turned instead to Stoll's caustic soda solution technique, but found that it was not to be depended upon for counting eggs in sheep's fæces. He very rightly points out his good reasons for refusing to accept the statement of advocates of this technique that irregular counts mean inaccurate counting, that the fault is in the man and not in the

[1] Zentralblatt f. Chirurgie, October, 1928.

[1] Amer. Jour. Hyg., November, 1928.
[2] Arch. f. Schiff- u. Tropen.-Hyg., 1926, xxx., 399.

method. He then indicates certain modifications which he has made in it, and he believes, as the result of eight counts only, that he has rendered it reliable. In all the circumstances, confirmation on a considerably larger scale is likely to be expected before this conclusion is generally accepted. In this instance inter-reaction between medical and veterinary practice has not yet proved particularly fruitful, the methods used not having an entirely sound foundation. But where conditions are more strictly comparable, there may at any time recur such remarkable results as have just been obtained by Hindle, whose knowledge of the work of Laidlaw in dog distemper and of Charles Todd on fowl plague led him so directly to the preparation against yellow fever of the vaccine whose potentialities for good are of such a promising nature.

DR. OLIVER GOLDSMITH.

THIS week sees the bicentenary of the birth of Oliver Goldsmith. He was born on Nov. 29th, 1728, the second son of the Rev. Charles Goldsmith, whose character is portrayed by his son in his description of the preacher in the "Deserted Village." "A man he was to all the country dear, and passing rich with forty pounds a year." Res angusta domi was such that it was proposed that Oliver should qualify himself for a trade, and with this end in view he was sent to the village schoolmaster to be instructed in the three R's. This worthy also figures in the "Deserted Village." To the importunity of Oliver's mother is due the fact that his father made some effort later on to give the boy a decent education in order to qualify him for one of the liberal professions. He was sent to the school at Athlone and at the age of 15 went to Dublin, where in June, 1744, he was admitted sizar at Trinity College. He ran away to Cork, after being chastised by his tutor, but thinking better of it he returned and took his B.A. in 1749. After many vicissitudes he went to Edinburgh in 1752 to study medicine and later to Leiden. Returning to England in a penniless condition, he accepted the post of usher in an academy at Peckham; this proving uncongenial, he became assistant to a chemist in the city, and after working in his laboratory for some time he at last began practice in Southwark and later moved to the Temple. In 1761 he made the acquaintance of Dr. Johnson and became a member of the Literary Club. He died, heavily in debt, in his forty-fifth year in 1774. His death was accelerated by taking a James's powder, which he insisted on doing despite the advice of his apothecary and physician who told him not to do so. Whatever his shortcomings in physic and his financial difficulties may have been, "Poor Goldie" certainly contributed some imperishable works to English literature, while the elegy on the death of a mad dog, with Caldecott's pictures, is among the childhood recollections of most of us. Horace Walpole called him "an inspired idiot," and Garrick protested that "he wrote like an angel and talked like poor Poll," but we can all of us now subscribe to surly Sam's sentiments as recorded in his epitaph in Westminster Abbey, "nihil quod tetigit non ornavit." Goldsmith's memory is among the chief glories of the medical profession.

A SIMPLE INDEX OF ANÆMIA.

THE colour of the face is admittedly a poor guide to the presence or absence of anæmia; the colour of the conjunctiva, as observed in the lower lid, may serve somewhat better, but the information it affords can hardly be described as accurate. Estimation of hæmoglobin and a count of the red cells carry us further, but it is necessary to bear in mind that without a knowledge of the volume of the circulating blood even these modern methods may give information wide of the mark. So far as the oxygen-carrying function of the blood is concerned, the important factor is the amount of hæmoglobin available per unit of body tissue; whether the hæmoglobin be concentrated or diluted does not, within limits, greatly matter. Dr. W. W. Duke, of Kansas City, has drawn attention [1] to what would appear to be a valuable clinical test for the determination of the presence or absence of anæmia, depending upon the observation of the colour of the palms of the hands. The fact that the colour of the palms when held in the same position is much the same in all healthy persons seems to have escaped the clinician. It is, of course, well recognised that the vessels of the palms are not subject to the same variations in calibre as those of the face; it is equally well known that even in dark-skinned persons the palms are relatively free from pigment. There are, it may be, limits to the truth of this statement, but the fact remains that the palms of most individuals of European extraction show little pigmentation. This being the case, it is obvious that they offer an admirable field for the observation of the concentration of hæmoglobin in the circulation, at least in those who do not habitually do manual work. For control a standard palm is necessary; this should be the palm of the observer, if he has first made sure that his palm colour is that of the healthy young adult. For the actual observation it is essential for observer and observed to be in the same posture and for the palms of both to be held at the same level. The difference in palm colour brought about by variation of level in respect to the heart can be demonstrated by anyone who will hold one hand above the head and allow the other to hang for a minute and then rapidly compare the two. Using this method, Dr. Duke states that he is readily able to identify even comparatively slight degrees of anæmia and plethora, while it serves as a ready means of following the degree of hæmoglobin restoration in the course of infusion of blood. This is the sort of observation that might have been expected of Hippocrates; it is refreshing to find such a simple and yet scientifically sound method turning up nowdays.

THE LIVER IN PRIMITIVE MEDICINE.

THE great and sudden popularity of liver treatment prompts inquiry into the part it has played in medicine in the past. According to the Babylonians, says Dr. H. Vorwahl,[2] the liver was the central organ and liver inspection was the chief form of augury. In man it was considered the source of the blood, and after the psycho-physical parallelism of the times, as the seat of the affections. This belief descended to the followers of Mithras, who recognised a triple fire-goddess corresponding to the three parts of the soul, and located the passions in the liver; it is also reflected in the Old Testament.[3] Horace wrote of it as the seat of love in words with a somewhat startling significance to clinical ears—"non ancilla tuum jecur ulceret ulla"!—and Juvenal spoke of the liver of an angry man as burning with fury. The Galenic conception of its function, which prevailed for many centuries, was that it converted chyle into blood. Megenberg, a leading anatomist of the fourteenth century, stated that it separated the valuable components of the chyle from the waste and transmitted them to the limbs as blood. This, however, is somewhat sophisticated lore, and in many regions where science has not penetrated the old Babylonian beliefs survive. Sir James Frazer says of the natives of Darfur, in the Western Sudan, that they eat the liver of animals to increase their health, and consequently the health of their souls. The custom is universal among the Arabs and other Sudanese tribes of taking every opportunity to eat raw liver, which is supposed to confer virility. Women, Frazer remarks, are forbidden to eat liver, as they have no souls. South-West African tribes excise the liver of a brave enemy and burn it to ashes, which are employed in the circumcision ceremonies to confer courage upon their young men. Our phrase, "white-livered coward,"

[1] Arch. Int. Med., 1928, xlii., 533.
[2] Deut. Med. Woch., 1928, xlii., 1769.
[3] Lamentations, II., 11.

conveys the same idea. Somewhat strange, however, is the phrase "white-livered" applied to women of strong sexual instincts in German peasant vernacular. The therapeutic use of liver is also general among primitive peoples; the Turks use liver applications in the treatment of the eyes after the manner related in Tobias, and we must admit that its use in pernicious anæmia is still just as empirical. On April 28th of this year we gave a few doubtful instances of its popular employment for anæmia, and mentioned that Nägeli records improvement in a patient who ate a great deal of *Blutwurst*. Black pudding is given for anæmia in some parts of England, whilst a letter in our correspondence columns on March 31st relates the use by Chinese doctors of the powdered liver of a carnivorous crow.

It is announced that the University of Edinburgh is to receive £15,000 for the endowment of the department of surgery. The sum of £10,000 has been given by the Rockefeller Foundation and the remainder by Mr. Thomas Cowan, whose contribution will form a surgical research fund.

We regret to announce the death after a brief illness of Mr. Charles Walter Good, who was for more than 20 years the manager of THE LANCET. A Londoner by birth, he entered the printing trade at an early age and founded in Burleigh-street, Strand, a business which became the Church Printing Company. So when he was invited by Mr. Wakley to help him in the production of this journal he already possessed an experience as a practical printer which made his work of the utmost value. On his retirement in 1920, the proprietors marked their appreciation of his services by the gift of a motor-car. He then went to live at Exhall, Warwickshire—where his son-in-law, the Rev. Frank Melville, was vicar—and devoted his spare time to church work, later removing to Pinhoe, Devon, where he qualified as a lay reader for the diocese of Exeter, and was shortly to have been ordained. Mr. Good was in his sixty-eighth year and leaves a widow and two daughters.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL.—An appeal is being made for £60,000 to clear off the debt upon this institution. Since 1918 the number of beds has grown from 200 to 420, the number of in-patients from 1161 to 2500, and the out-patients attendances from 48,700 to over 80,000. There are still more than 800 children awaiting admission.

PRESENTATIONS TO MEDICAL MEN.—Dr. John Osbert Wilson, joint parish medical officer of Huntley, who has retired after 50 years practice in his native town, was on Nov. 16th entertained at dinner in Stewart's Hall and presented with a gold wristlet watch, suitably inscribed, as a token of the great esteem in which he was held by the community. Mrs. Wilson was also presented with a platinum and diamond wristlet watch.—Presentations by the townspeople of Kirkby Lonsdale and farm tenants were made on Nov. 19th to Dr. William Smith Paget-Tomlinson in recognition of his public work and in celebration of his eightieth birthday. Dr. Paget-Tomlinson retired from practice over 20 years ago, and was High Sheriff of Westmorland in 1897. He established the Westmorland Sanatorium for Consumptives, and since going to Kirkby Lonsdale from Forton nearly 40 years ago has been a munificent benefactor of the Grammar School, the Church, and the School for Clergy's Daughters at Casterton.

DONATIONS AND BEQUESTS.—The late Captain Bernard John Merlin Walsh, of Nayland, Suffolk, left £1000 each to the Hospital and Home for Incurable Children, North Court, Hampstead, the Hospital for Sick Children, Great Ormond-street, the Paddington Green Children's Hospital, St. George's Hospital, Hyde Park-corner, and the Essex County Hospital, Colchester.—By will the late Mr. Herbert Pickersgill, of St. Paul's-road, Manningham, Bradford, left £10,000 to the Dewsbury and District Infirmary, provided it is still supported by voluntary subscriptions and not controlled by the State or the local authority.—Mrs. Eliza Annie Smith, Sheffield, left £500 each to the Royal Hospital, the Royal Infirmary and the Jessop Hospital, Sheffield.—Miss Lily May Broderip, Durnham Park, Bristol, left £1000 to St. Luke's Hostel, Fitzroy-square, for founding two beds in memory of her mother and sister Eva.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XIII.—TESTS OF RENAL EFFICIENCY.

By G. A. HARRISON, M.D.,
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II.*

BLOOD ANALYSIS: DYE TESTS.

BLOOD ANALYSIS.

THE normal findings in a blood analysis are as follows:—

Substance.	Mg. per 100 c.cm.	B.P. or S.†
Urea { On average diet	15 to 40 (even 50 in old age)	B.P.S.
Urea { 2½ hr. after 15 g. urea	40 to 80	
Non-protein nitrogen ..	25 to 50	B.
Uric acid	1 to 4	B.P.S.
Creatinine	0·7 to 2	B.P.S.
Cholesterol	100 to 200	B.P.S.
Proteins { Albumin ..	3400 to 6700	P.S.
Proteins { Globulin	1200 to 2900	
Inorganic phosphate { Adults ..	2 to 4	P.S.
Inorganic phosphate { Children ..	4 to 6	
Calcium	9 to 11	S. P. (citrated).
Alkali reserve (Plasma bicarbonate)	50 to 75 vols. CO_2 per cent.	P.

† B. indicates whole blood (oxalated), P. plasma (oxalated except in case of calcium), and S. serum.

In practice, an estimation of either urea or non-protein nitrogen is all that is necessary in the majority of cases. Urea is generally estimated rather than non-protein nitrogen because the technique is simpler. Since urea nitrogen constitutes by far the greatest percentage of the total non-protein nitrogen, it is only rarely that the latter test gives more information than the former.

BLOOD-UREA.

In this test the concentration of urea in the blood is determined to see whether there is a retention of urea.

Technique.

The vast majority of methods require at least 1 c.cm. of blood; 3 c.cm. is desirable as a rule. Therefore the blood is obtained by venepuncture. H. E. Archer and others, however, have modified Folin's technique, so that estimations may be made on 0·2 c.cm. blood obtained by skin puncture. This micro-method is valuable if little blood is available, and particularly in children, or when repeated determinations have to be made on the same patient (blood-urea curves). It does not matter whether whole blood, oxalated plasma, or serum be used, in that urea is approximately evenly distributed between corpuscles and plasma. The urea content of the blood and of the various body fluids are practically uniform. This point is of practical importance in that cerebro-spinal fluid or œdema fluid may already have been obtained and be available for analysis. It has even been suggested that the saliva be utilised for estimation of urea instead of the blood, but recent work casts doubt on the value of the salivary urea. In nearly all methods urea is estimated with the aid of urease. The hypobromite method is not recommended for blood, though it will readily reveal gross retention of urea.

Interpretation of Results.

The concentration of urea in the blood is very little influenced by ordinary mixed meals. It does not matter, therefore, at what time of the day the blood

* Part I. appeared in THE LANCET last week.

is obtained. The blood-urea, however, though slowly, is sometimes extensively affected by great reduction of protein in the diet. For this reason the blood urea may be misleading in some cases of kidney disease. Cases of uræmia have been reported in whom the blood-urea was reduced from very high values to within normal limits solely as a result of the restriction of proteins. The same difficulty is occasionally experienced in cases of enlarged prostate with severe anorexia. For this reason the estimation of urea at a known interval after a standard dose of urea has been advocated. A convenient method is to combine the urea-concentration test with the estimation of urea in the blood. Urea administered by the mouth is rapidly absorbed. At the end of an hour, after 15 g., the blood-urea is approximately doubled in a normal person.

The chief difficulty in interpreting the meaning of an increase in the urea content of the blood lies in the exclusion of non-renal causes of increase. Thus severe diarrhœa, gastro-enteritis, &c., and, in fact, any cause of severe anhydræmia, tends to raise the blood-urea. A failing circulation has a similar effect, in this case, owing to the diminution of urinary secretion as a result of the fall in blood pressure. In addition to cardiac cases proper, the circulation is deficient in the terminal stages of many diseases. For this reason the value of estimations of blood-urea made shortly before death is often difficult to assess. Another cause of slightly raised values is excessive protein destruction—e.g., in diabetics submitted to severe undernutrition. The rise of blood-urea in these non-renal cases is usually only moderate, of the order of 50 to 100 mg. per 100 c.cm. of blood. As MacLean has emphasised, they may often be distinguished by estimating the concentration of urea in the urine, which will be found to be high, over 2 per cent. and sometimes over 4 per cent. A fuller account of the interpretation of blood-urea analyses in general will be found in a subsequent article in this series.

Value of the Test.

It will be seen that owing to the difficulties of interpretation the value of an estimation of the blood-urea is limited. None the less it is the simplest of the "retention" tests, and its extensive employment has led to wide recognition of its *limitations*. In proved kidney cases it is valuable both in the assessment of the progress of a case and as a guide to treatment. In the diagnosis of uræmia it is very useful, and there is generally little doubt as to the meaning of really high figures—e.g., over 100 mg. In doubtful cases its value is greatly enhanced if combined with an estimation of the concentration of urea in the urine, either as part of the urea-concentration test or even in isolated specimens of urine. In fact, when used as an aid to diagnosis it is a good rule always to perform urinary estimations if the blood-urea lies between 50 and 100 mg.

An estimation of urea in the blood, like the urea-concentration test, is a measure of the efficiency of nitrogenous excretion, and of that only. The remarks made in this connexion in discussing the value of the urea-concentration test apply with equal force to the blood-urea.

OTHER ANALYSES.

Uric acid and *creatinine* are retained along with urea in severe renal inefficiency. As a rule no additional information results from their estimation. The uric acid may rise to 30 mg. It is said that the prognosis is almost always hopeless if the creatinine rises above 5 mg. in chronic renal lesions.

In chronic parenchymatous nephritis (nephrosis) the blood *cholesterol* is often raised (200 to 1000 mg.), but the diagnosis is usually obvious on clinical grounds and generally the estimation gives no additional help in either prognosis or treatment. The *plasma* or *serum proteins* are often lowered in the same disease, and this fall is due much more to loss of albumin than of globulin, so that the ratio of albumin to globulin becomes lowered. The differential estimation of plasma proteins is a relatively complicated procedure, and the results generally give no useful additional information.

In gross renal inefficiency (uræmia) the *inorganic phosphate* is often raised (5 to 20 mg.) and the *calcium* lowered (9 to 5 mg.), but from the clinical point of view their estimation is usually superfluous. *Indicanæmia* (retention of potassium indoxyl sulphate) often occurs in uræmia, and Andrewes's diazo reaction provides a simple qualitative test for this, but the reaction is only positive when the blood-urea also is raised, so that it is not likely to be used extensively. Estimations of the *alkali reserve* provide a rough measure of the degree of acidosis in severe renal disease, and may be useful in controlling alkali treatment.

DYE TESTS.

1. *Indigo-carmine.*—This test is used extensively in surgical work, and almost invariably by the surgeon himself. The dye is injected intramuscularly in amounts varying between 0·08 and 0·16 g. (20 c.cm. of 0·4 per cent. solution = 0·08 g.). Either the combined urine or the segregated urines (obtained by ureteric catheterisation) are then examined. The points to be noted are the time elapsing between injection and the first appearance of the dye, the time of maximum colour, and the time required for complete excretion. The indigo-carmine test is therefore a "time" test. Quantitative colorimetric determinations are not satisfactory. The test is used particularly in diagnosing which is the kidney affected, or in obtaining a rough comparison between the efficiency of each of the two kidneys. The following table may be useful in interpreting the surgeon's report.

—	Normal.	Abnormal.
Appearance of colour ..	5–20 mins.	Delayed beyond 20 mins.
Maximum colour	About 45 mins.	After 1 hour.
Total excretion	Complete in 14 hours.*	Delayed beyond 14 hours.

* Greater portion in 12 hours.

2. *Phenol Red or Vital Red* (phenolsulphonephthalein).—This dye is used both as a "time" test (in the same way as indigo-carmine) and as a quantitative test. Injections are made subcutaneously, intramuscularly, or intravenously. The usual amount is 6 mg. (0·006 g. in 1 c.cm.).

When the test is used as a "time" test, the patient drinks enough water (about 300 c.cm. or 10 oz.) to ensure a good flow of urine. On completion of catheterisation the dye is injected, and the urine is received in a test-tube containing a few drops of liquor potassæ or soda solution (10 to 25 per cent.).

—	Normal.	Abnormal.
Appearance of colour ..	5 to 10 mins.	Delayed beyond 10 minutes.
Maximum colour	15 to 20 mins.	20 minutes.
Total excretion	Complete in 4 hours.*	4 hours.

* Greater portion in 2 hours.

When it is used as a quantitative test, the patient is instructed to empty the bladder completely (specimen 0) and to drink about half a pint of water. The 6 mg. of dye are then injected. The urine is collected at the end of one hour and again at the end of two hours after the injection. The quantity of dye in each of these specimens is estimated colorimetrically. Normally, 40 to 60 per cent. of the dye is recovered at the end of the first hour, and 15 to 25 per cent. at the end of the second hour. The total recovery in the two hours normally varies from 60 to 85 per cent. Figures below 40 per cent. (first hour) or 60 per cent. (two hours combined), suggest renal inefficiency. It should be noted that children excrete phenol red better than adults. In two hours normal children excrete 70 per cent. or more.

The phenol red test is a measure of the power of the kidneys to excrete a foreign substance. It has been very extensively used in America and to a less extent in this country. The general consensus of opinion is that it runs parallel with the blood-urea. It is subject to practically the same limitations as the latter, when used as a quantitative test.

CONCLUSION.

The examination of the patient, together with tests for proteinuria and a microscopical examination of the centrifugalised deposit, remains the essential investigation of every patient. The surgeon will often extend his examination by using the dye tests in conjunction with catheterisation, and both physician and surgeon will often employ the urea tests with advantage. The remaining tests are of value in certain selected cases and in special investigations.

Special Articles.

MEDICINE AND THE LAW.

Unsuccessful Action against the Royal Microscopical Society.

MANY learned societies promote education and scientific research with financial resources which leave no great margin for unexpected expenses. One such expense is the cost of self-defence against unsuccessful claims in the law courts. An action was brought last week in the High Court against the Royal Microscopical Society, its President, and joint honorary secretaries, the claim being for damages for alleged wrongful dismissal and defamation of character. The plaintiff had been secretary for nine years, but had his employment terminated in May, 1927, on three months' notice in accordance with the terms of his engagement. He actually received three months' salary with his notice, but he had, it seems, no grievance on the ground that he had not been called upon to do work for the final months. So much for the allegation of wrongful dismissal; it was clear that the Society terminated the engagement in an entirely lawful manner. The alleged defamation consisted merely in the circumstances that the executive of the Society recommended the termination of his engagement, and that an instruction was given that this recommendation be placed on the agenda paper for the next meeting of the Council. Naturally the defence was a plea of privilege and that the words, if spoken, were spoken in pursuance of the defendants' duty without malice and in the honest belief that they were true. At the close of the plaintiff's evidence and after listening to a recital of incidents which the judge declared to be appropriately microscopical, the court held that the plaintiff had no case in law. Mr. Justice McCardie directed the jury to return a verdict for the defendants, who had not been called upon to answer the plaintiff's case. The jury returned a verdict as directed and judgment was entered for the defendants, whose counsel intimated that he did not ask for the usual costs, but for an order limiting costs to the out-of-pocket payments made by the defendants.

The history of common law claims in the English courts indicates the evolution of certain formal causes of action to which plaintiffs have been confined. The issues being strictly delimited and the evidence being restricted to what is relevant to those issues, it by no means follows that a man with a grievance has necessarily a legal remedy. By invoking the law of libel and slander, however, a plaintiff can often ventilate in the law courts some matter and can obtain the verdict of a jury upon some issue which otherwise would escape the strict legal categories of wrongs and damages. On the other hand, the rules of procedure provide for the striking out of frivolous and vexatious proceedings. It is unfortunate for a plaintiff that he should be so misguided by his legal advisers as to embark on proceedings which are found to be unwarranted and hopelessly bad in law. It is even more unfortunate for a scientific society that, after acting with entire propriety, it should have its funds depleted by the cost of defending itself against an action which should never have been brought.

Car-hire for Patient: Doctor's Liability.

A medical practitioner, who arranged for the conveyance of a patient from Eastbourne to Balham, has been held personally liable for the cost of hiring the car. The doctor had taken the precaution of obtaining the patient's consent before telephoning the order for the motor-car. But he did not explicitly inform the car proprietors that he was acting on the patient's behalf—a fact which one might almost assume to be self-evident in the circumstances—and the omission was fatal. The county court judge declined to hold that there was any custom or usage by which it could be deemed notorious that the doctor was acting as agent; this contract for a journey of 120 miles was, said the judge, something different from ordinary routine, even if in small matters a doctor might be regarded as an agent without express statement. The car proprietors evidently preferred to sue the doctor rather than the patient, and, according to the report of the case in the *Times*, Judge Cann found two important facts in their favour. In the first place, he found that the doctor, in giving the order, did not mention that he was acting as agent; this circumstance made the doctor prima facie liable as a principal. Secondly, he found that the car owners did not give credit to anyone to the exclusion of the doctor, nor did they elect to rely on the credit of anyone else but him. These phrases follow the lines of leading cases on the law of principal and agent, and the findings of fact may prove significant when—as appears likely—the matter is taken to a higher court.

Nurses and National Health Insurance.

There has been some doubt whether the National Health Insurance Act applies to trained nurses who are members of an association. The proprietress of such an association was summoned by the Ministry of Health at the Marylebone police-court for non-payment of health insurance contributions. The Ministry's representative relied upon the terms of the association's rules under which the nurses were paid 12*s*. out of every 21*s*. received by the association, and were provided with board, lodging, and laundry; this, it was suggested, was a fixed wage, and a direct contract of service within the meaning of the Act. For the defendant it was argued that the nurses were merely maintained while not nursing; they were not paid wages and, therefore, were not insurable. No ruling was given on the facts or the law as the defendant apparently paid up the disputed contributions before the case came on for hearing. The Ministry's representative, not content with the satisfaction of his claim, pressed for a penalty and costs, but the magistrate merely adjourned the case sine die.

Powders for Cancer.

In reply to a note under this heading in our last issue Mr. Raphael Roche writes to point out that the patient consulted him on Oct. 22nd, not "last September"; that his charge of 15 guineas was a reduction on his ordinary fee of 20 guineas for a first consultation; that the patient did not "become" very sick after taking his powders, but continued to be very sick; that he did not say "the drugs I make" but "the drugs I make use of"; that he said the phosphorus in the powders could be revealed only by the sensitiveness (not "study") of the vital force; and finally that the form which he requires patients to sign is to the effect that he is not a legally-qualified medical (not "unqualified") man.

A LEICESTER CHILDREN'S HOSPITAL.—Roecliffe Hall, near Leicester, with 40 acres of land, has been bought by the Leicester and County Saturday Hospital Society for a children's hospital. It is intended to adopt it for the reception of 50 or 60 children, at an approximate cost of £25,000

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Pit-head Baths.

AT the Dalzell and Broomside Colliery of the Glasgow Iron and Steel Company, Motherwell, an installation of pit-head baths, the first in Scotland, is to be opened on Nov. 24th by Lord Chelmsford, chairman of the Miners' Welfare Committee, under whose auspices the experiment is being made. The installation is distinctive in having accommodation for female as well as for male workers. The scheme provides for bathing accommodation, locker rooms for pit and ordinary clothes, facilities for the cleaning and greasing of pit boots, drinking fountains, filling points for water bottles, a canteen and a first-aid room.

This is the second of four demonstration baths to be erected by the Miners' Welfare Committee. The first was at Pooley Hall Colliery, Warwickshire, opened in April last, the two others now in hand are at Trerochy in South Wales and Mainsforth in Durham. Minor experiments on these lines have been undertaken by at least one of the Scottish companies; but the manager found that the men were not enthusiastic. Now that the money is available from the Welfare Committee, which was established as a result of the Sankey Commission, opinion seems to have changed, and it is hoped that this admirable new installation will appeal to the colliers.

Ten years or more ago, in a survey of the principal Scottish coal-fields, I came across two or three examples of a traditional custom among the miners—for instance, that in washing their bodies after coming from the pit they were careful not to wet the spinal column, and the result is—I have seen it in actual fact—a black streak about 2 or 3 inches wide running from occiput to coccyx. The explanation given to me was that the washing of the spinal column had a "weakening effect." I discussed the point with several miners who carried on the practice, but they could give only the traditional reason for it. One never likes to set aside as absurd, without inquiry, a well-established habit passed on from generation to generation.

A Settlement Case.

It is to be hoped that reforms in local government will make an end once for all of the endless waste of time and money of parishes over settlement cases. In the Sheriff Court at Ayr, Sheriff-Substitute Haldane has been commenting strongly on a squabble about £42 1*s.* 9*d.* He said:—

"It is no doubt a matter of great importance to the rate-paying public that poor-law relief should not be paid at their expense to persons who are not legally entitled to it from them, but I think it is at least equally important to them that parish councils should not be allowed to dissipate their funds on superfluous litigations. It is, accordingly, of more importance, in my opinion, that such a matter once decided, even if it be wrongly decided, should not be again made the subject of costly litigation than that an ideally accurate decision should be arrived at. The only apparent reason which the parish council of Girvan have for wanting to reopen the case is that their officers have all along held so strongly to their own opinion of the man's condition that they were unable to accept the decision of the Board of Health, as they agreed to do, when it happened to be adverse to them."

The question of parochial settlement has been a burning one for three generations. It cannot be reformed all at once; but I should think it probable that the new Act will put the whole of these petty problems of the small parishes on a better footing. Thousands upon thousands of pounds have been wasted in legal proceedings with no more justification than the one here commented on.

Watered Milk.

Sheriff Jameson has imposed a fine of £35 on a milk-seller guilty of three offences and previously fined £5 and £10. The milk showed 36 per cent. reduction in butter-fat and 38 per cent. added water. In imposing the fine the Sheriff reminded the seller that the maximum fine was £100. This fine of £35 is drastic, but not beyond what these cases deserve. It is difficult to see why in this peculiarly debased form of swindling any sheriff should hesitate to impose the maximal fine. Indeed, it is a question whether traders of this type of morality should be retained in the trade at all. They might, at least, have their licences endorsed like the erring motorists.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Poor-law Salaries in County Mayo.

THE salaries paid to dispensary medical officers in County Mayo have long been a standing reproach to poor-law administration in the Irish Free State. It is one of the few counties in which there is no county scale of graded salaries. Salaries are still paid on the same basis as when the administrative area was the dispensary district, not the county. The consequence is that there is no uniformity between the salaries paid in neighbouring districts. In one district the salary is as low as £100 a year. In another the scale runs to £250 a year. On many occasions during the past six years appeals have been made to the Minister for Local Government and Public Health to intervene, and insist on the payment of adequate salaries. He has recently addressed an important letter to the County Board of Health in which he states that the salaries have never been adjusted to meet in any way the increased cost of living, as has been done elsewhere throughout the Irish Free State. He feels that a point has now been reached when in justice to the officers concerned and in the interest of the public services for which they are responsible, steps must be taken to ensure the payment of fair and reasonable salaries. He proposes that a scale of £200 a year with annual increments of £5 a year to a maximum of £300 a year should be established. The County Board should also review the salaries of the medical officers and surgeons of the county hospital and of the medical officers of the county home. It is pointed out that approximately half the expenditure of the County Board is at present borne by central funds, so that the payment of adequate salaries to the medical officers will not press unduly on the ratepayers. The receipt of the Minister's letter appears to have caused dismay among the members of the County Board of Health, and action on it was postponed, although one member admitted that the rates in County Mayo were the lowest in the country. It is hoped that the Minister will, if necessary, fix salaries by a sealed order, as he has the power to do. The hardship of medical officers in County Mayo entailed by inadequate salaries is increased by the fact that the districts are large and travelling expenses are high, while there is, in the greater part of the county, very little private practice.

Clean Milk.

A deputation from the Irish Clean Milk Society waited last week on Mr. Richard Mulcahy, Minister for Local Government and Public Health, and presented a petition begging for legislation to ensure a supply of clean milk for the Irish Free State. There were nearly 3000 signatures to the petition. In reply, the Minister assured the Society of his full sympathy with its objects, and he stated the the report of the Inter-Departmental Committee on Milk was receiving careful study with the view of framing legislation on it. He would discuss the matter with the Society again in January next.

Disseminated Sclerosis.

The outgoing President, Dr. William Porter, of Portrush, took the chair at a meeting of the Ulster branch of the British Medical Association on Nov. 22nd, and introduced Dr. Foster Coates, of Belfast, as President for the session. Dr. Coates

then delivered a presidential address on disseminated sclerosis, based on a series of 106 cases treated in the medical wards of the Royal Victoria Hospital, Belfast. This series, he said, had occurred among 728 neurological admissions, a ratio of 14·5 per cent., as compared with 6 per cent. amongst the admissions to the National Hospital, Queen-square, London. The speaker was convinced that these figures represented the greater incidence of the disease in Northern Ireland, and were not the result of diagnostic errors. His inquiry into environment and occupation tended to confirm Adams's contention that the disease is commoner in country than town, but showed no marked incidence among woodworkers. He next considered the various ætiological theories which have been advanced; in considering physical signs he classified the cases into an acute remittent and a chronic progressive type, and considered the prognosis rather better in the former. He had observed one case in which there had been a remission of 11 years' duration. He briefly reviewed the various forms of treatment which have been advocated and expressed the opinion that recurrent courses of silver-salvarsan appeared to delay the progress of the disease.

Dr. A. Gardner Robb proposed, Dr. J. C. Loughridge seconded, and there was passed by acclamation a hearty vote of thanks to the President for his address.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Relative Humidity and Health.

DURING the last eight years research work of great importance has been conducted at Pittsburgh to determine what are the physical conditions of our atmospheric environment most conducive to comfort, efficiency, and health. This work has been carried out by the research laboratory of the American Society of Heating and Ventilating Engineers with the coöperation of the Federal Government through its Bureau of Mines and Public Health Service at a total cost of something like $40,000 a year. The engineers' work, under the direction of Mr. F. C. Houghton, has been confined to studies on temperature, humidity, and air motion. The results up to date were summarised at the recent meeting of the American Public Health Association in Chicago by Mr. Houghton himself in collaboration with Mr. W. W. Teague. Much of the work reported on this occasion has already been published in the *Journal* of the A.S.H.V.E. and has been widely noticed by physiologists and sanitarians. Quite recently the laboratory has been investigating the problem of the relation of relative humidity to health, a problem which is more pressing in the winter climate of North America than it is in England. Mr. Houghton points out that when the outdoor temperature is zero with 60 per cent. relative humidity, the air indoors without humidification will have a relative humidity of 3·1 when heated to 70° F. Many furnace-heated houses in this country are kept constantly at a higher temperature than this. It is true, Mr. Houghton says, that one pound of outdoor air and one pound of hot indoor air will each extract the same quantity of moisture from the respiratory tract before being exhaled at a temperature of approximately 98°. The latter, however, has a much greater affinity for moisture when it first enters the mouth or nasal cavity, and will rapidly take a large amount of moisture from the mucous membrane near the entrance to the mouth or nose, whereas the cold air will take up moisture more slowly in passing on toward and into the lungs as it is being warmed up. It is to the need for investigation of this phase of the subject that the authors of the paper finally draw attention.

Bacteriophage and Vaccines.

Another striking paper presented to the Public Health Association this year came from the State Department of Health at Lansing, Michigan. The immunologist of this department, Mr. N. W. Larkum, Ph.D., has during the last five years been investigating the possibilities of applying the properties of bacteriophage to public health work. He has met with considerable success, as have other workers, in treating staphylococcal infections from furunculosis to osteomyelitis. He points out that bacteriophage-lysed cultures can produce all the antibodies obtained by use of an ordinary heat-killed vaccine and that the former will also increase the opsonic index to a remarkable degree. Using lysed cultures of *Bacillus typhosus* and *B. paratyphosus* A and B, Mr. Larkum finds that large doses can be given to human subjects without any general reaction resulting and with only a slight local reaction. Agglutinin production in the subject takes place to the same degree, but more rapidly by this new method. The technique for producing this new vaccine is very simple and inexpensive. Up to the present no antiseptic has been added to the vaccine as a preservative, since none has been found which is innocuous to the bacteriophage. It is not clear, however, that destruction of the phage would in any way diminish the antigenic value of the vaccine. Mr. Larkum has avoided antiseptics merely because this "destroys the possibility of using the bacteriophage for treatment."

Public Health Services.

SCHOOL MEDICAL SERVICE.

Name of district.	No. on roll.	Aver. elem. school attendance.	No. of routine children examined.	No. of special examinations and re-inspections.	Percentage of children found on routine examination requiring treatment.*
Bristol	55,144	48,250	15,599	42,355	12·5
Eastbourne ..	4,911	4,428	1,455	5,886	13·19
Leeds	—†	—†	19,164	71,239	28·8
Stockport ..	15,529	13,419	5,034	12,819	21·91
Swindon ..	9,136	7,972	3,198	6,989	23·3

* Excluding dental defects and uncleanliness. —† Not stated.

Bristol.

IN Bristol there are special schools of all the usual types, including those for myopes and the partially deaf, so that the return of exceptional children shows unusually few who are "still attending elementary school" or "at no school or institution." The only provisions still needed appear to be a residential open-air school and some accommodation for epileptics. Orthopædic work is well organised. Mr. H. Chitty, orthopædic surgeon to the committee, conducts a clinic at the Red Cross-street special school, for which an additional masseuse and up-to-date apparatus have been recently provided. Much of the medical work consists in the provision of surgical boots and appliances; constant supervision is necessary to keep these in good repair and to effect necessary alterations as the children grow or their conditions change. Operations on children attending the clinic have been performed either to prevent or to cure deformities or with the object of dispensing with cumbersome surgical appliances. In most cases the results have been very successful, and there are few children whose general condition has not markedly improved since they commenced to attend the clinic.

The cost of apparatus is borne by the parents, by the Education Committee, and by the Bristol Cripple Children's Society. This society has also helped to send 14 children to open-air hospital schools and 71 to other hospital convalescent homes. It is hoped that a start will soon be made on the erection of a special

voluntary hospital for orthopædic cases at Winford. Much attention has been devoted to infantile rheumatism and heart disease, and Dr. R. A. Askins gives a table showing the percentage of deaths from heart disease to total deaths from 1921 to 1927:—

	1921	1922	1923	1924	1925	1926	1927
Percentage of total deaths	12·38	12·01	13·27	14·02	13·1	14·82	16·26

These figures show a marked increase, and apart from loss of life there are the long periods of invalidism and incapacity for work from their cause. He estimates that a quarter of the total deaths from heart disease are due to rheumatism arising during school ages. In 1923 began the investigation by Dr. Carey Coombs and Dr. C. Herapath which led to the elaboration in 1927 of a definite scheme. A clinic has been established in the University Centre of Cardiac Research at the Bristol General Hospital under Dr. Carey Coombs, and all cases of rheumatic infection in any form and of non-rheumatic heart affections in children are invited to attend. In addition the medical practitioners in Bristol have been asked to notify cases and an admirable response has been obtained. The objects are: (1) expert early diagnosis; (2) treatment (including regulation of school curriculum); (3) research into causation, including house visits by medical officers of the school medical service to the homes to inquire into environmental conditions and family history. Dr. Herapath is doing similar work for the Somerset Education Committee. The whole scheme seems to be an excellent example of coöperation between hospital consultants, general practitioners, and the school medical service.

Eastbourne.

The proportion of children of school age is low in Eastbourne and is progressively diminishing. In 1891 it was 21·19 per cent. and in 1921 it was only 16·40 per cent. of the total population. Many of the children are residents at boarding schools, so that the number attending elementary schools is very small—less than 5000—but the provision for treatment of defects and for the care of exceptional children gives an example of what can be done.

Clinics are held for minor ailments, eyes, throat and ears, teeth, ringworm, tuberculosis, and malnutrition and for orthopædic cases, as well as the examination clinic for mentally abnormal children. The orthopædic clinic has the service of a visiting consultant, Mr. J. B. Barnett, and much help is given by the "Tiny Tims" clinic run by a voluntary society. There is no special school for cripples, but their number in Eastbourne appears to be very small. Very satisfactory results are obtained both at the special mental defective school largely through the personal influence of the head mistress, and at the open-air school formed by the alteration of army huts in 1920, where the marked gain in physical well-being has enabled many previously delicate children to return to the ordinary school to compete on equal terms with the other children. The fact that in a town like Eastbourne, with its environmental and climatic advantages, open-air school accommodation is deemed necessary for 75 children shows how much greater is the need for such provision in many industrial towns where no such facilities exist. There are in Eastbourne only ten abnormal children not attending any school, and of these two are crippled inbeciles and the other eight are under regular treatment. Captain Stainfield was appointed organiser of physical training in 1923, and Dr. W. G. Willoughby emphasises the value of his work on the health of the children, and endorses the view that physical training should be carried out in the open air whenever possible.

Leeds.

The report of Dr. Algernon Wear on the school medical work in Leeds is accompanied by many tables, which show how great and varied are its activities; these were, nevertheless, curtailed by the shortage of medical staff due to an unfilled vacancy and unavoidable absences on account of sickness. The number of routine inspections outside the age-groups has fallen and there has been a partial cessation of the special inquiries, while the liaison work between the tuberculosis department and the school medical service has suffered. Similarly, there has been an unfilled post in the dental staff, so that six dental clinics have had to be worked by five full-time and one part-time officer. The low percentage of those treated to those requiring attention (59·2 per cent.) is, however, less attributable to this shortage than to parental indifference. The institution of casual sessions for cases of toothache is undoubtedly an immediate boon to the sufferer, but there is a danger of the parents relying too much on this expediency and failing to appreciate the need for conservative treatment. The general level of nutrition shows a slight improvement on last year, and Dr. St. Clair Stockwell has made use of the formula $Q = W \div H$ which is very convenient for practical purposes, although many authorities have shown that it is not reliable for accurate scientific investigation. In spite of the improvement there is a very large number (910) of children urgently needing the régime of an open-air school, many of them entirely out of school, and many more who will go to swell the number of chronic invalids in later life, including especially the tuberculous. At a joint meeting of representatives of the education and health departments it was unanimously agreed that an open-air school was a necessity, and Dr. Wear visited Newcastle to see the Pendowes open-air school. In this matter Leeds is notably behind most other authorities, for the nearest approach at present to any provision for open-air education is the small camp school at Ilkley mentioned in the interesting report of Mr. Jarman, the organiser of physical education. Some special inquiries were carried out. One dealt with the influence of locality on lung affections, and showed that there is a much greater prevalence in schools in low-lying districts than in those in higher altitudes (9·9 per cent. as against 4·7 per cent.) and for bronchitis alone the difference was even greater. Another inquiry concerned the influence of previous infectious disease upon the number of defects found at routine inspections; the results pointed to the interesting conclusion that attacks of the exanthemata lessened the tendency to later defects.

Stockport.

Considering its size there are not many facilities for dealing with exceptional children in Stockport, but it is evident that under Dr. N. Gebbie full use is made of whatever is available, and in stating the needs for extensions only the most urgent matters are set out. There are no special schools of any kind in the borough, but a fair number of mentally defective, deaf, and blind children are sent to outside institutions. There are 537 delicate children still attending elementary schools, but it is hoped that a scheme will be brought forward at an early date to provide some open-air educational facilities; meanwhile good work on a small scale has been done through voluntary bodies such as the George Fearn Trust, which sent some 97 children in the past year to residential open-air schools. There is no physically defective school nor an orthopædic clinic under the authority itself, though the committee has accepted financial responsibility for children requiring orthopædic treatment at the Stockport Infirmary, where artificial sunlight treatment has just been installed. Some cases have also been sent to the Shropshire Orthopædic Hospital at Oswestry. The pressing necessity for further dental help is realised; already a great deal of the dentists' time has been taken up by "casuals," thus seriously encroaching on the time that should be available for routine inspection and treatment. There is manifestly here something of the nature of a vicious circle, for the less completely it is possible to carry out proper routine inspection and treatment the larger will be the number of casuals, and the more casuals there are the less possible it is to carry out dental work in the best sense. The only remedy is to have an adequate

staff and to eliminate the casuals or at least render their number relatively unimportant, and the fact that the parents are at last beginning to lose their apathy makes the need for improved facilities all the more essential. With a complete dental scheme there will be, as has been demonstrated in some other parts of the country, a steady increase in the number of children with sound teeth with marked benefit to their general health, and ultimately an actual reduction in the amount of dental work required.

Swindon.

Dr. Dunstan Brewer remarks that each year it becomes more anomalous to describe the health of the school child separately from that of the general population. A strong link is being forged by the development of infant welfare work; many of the defects and diseases which were formerly discovered in the examination of school entrants are now recognised and dealt with at an earlier stage. Looking forward Dr. Brewer sees the main function of the school medical service to consist in determining the kind of education for which the child is fitted. In inculcating health as a positive function—a task in which the teachers should be partners—he mentions appreciatively the Board of Education "Handbook of Suggestions in Health Teaching" and the journal *Better Health*, issued by the Society of Medical Officers of Health. He says that some types of defect tend to maintain almost a constant level, but others will be affected by the extended treatment of infants and others by such means as the ionisation treatment of ear disease and the thallium method for ringworm described in some detail by his assistant, Dr. G. W. Fleming. In the treatment of ear disease a great advance has been made by the recent establishment of a special clinic under Mr. Kenneth Lees. In dental work good progress is being made. Already the fillings of permanent teeth greatly exceed the extractions, and it is probably quite true that the time will come when the removal of a tooth will be looked upon as an exceptional procedure and "eventually considered a malpraxis."

Special investigations describe: (1) Inquiry into ventilation in schools by the use of the katathermometer (Dr. Fleming). (2) An account by Dr. V. Redman King of the social and physical conditions of 104 children suffering from tonsils and adenoids, who have been known from birth. The results so far seem to show no relation to breast-feeding or housing conditions. (3) The connexion between multiple hair vortices and the mental condition was investigated. These vortices were found in 6 per cent. of ordinary children, and they were not more frequent in the few mentally defective children in Swindon. Hence the presence of these vortices, one of the so-called stigmata, is of scarcely any value as evidence of mental deficiency.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED NOV. 17TH, 1928.

Notifications.—The following cases of infectiou disease were notified during the week:—Small-pox 162 (last week 149); scarlet fever, 3002; diphtheria 1144; enteric fever, 61; pneumonia, 976; puerperal fever, 45; puerperal pyrexia, 125; cerebro-spinal fever, 8; acute poliomyelitis, 12; encephalitis lethargica, 21; dysentery, 10; ophthalmia neonatorum, 97. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Nov. 20th–21st was as follows: Small-pox, under treatment 20, under observation 1; scarlet fever, 2692; diphtheria, 2054; enteric fever, 24; measles, 73; whooping-cough, 312; puerperal fever, 18 (plus 10 babies); encephalitis lethargica, 71; poliomyelitis, 3; "other diseases," 15. At St. Margaret's Hospital there were 12 babies (plus 6 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 2 (1) from enteric fever, 19 (0) from measles, 5 (0) from scarlet fever, 19 (4) from whooping-cough, 37 (8) from diphtheria, 73 (18) from diarrhœa and enteritis under two years, and 72 (12) from influenza. The figures in parentheses are those for London itself.

The fatal case of enteric fever outside London occurred at Middlesbrough. Sunderland reported 5 fatal cases of measles and Newcastle-on-Tyne 3. Two fatal cases of whooping-cough were reported from each of Birmingham, Liverpool, Manchester, Salford, Leeds, and Middlesbrough. Liverpool reported 7 fatal cases of diarrhœa, Manchester 6, Birkenhead and Sunderland 4 each; while for the same week the figures for Glasgow, Dublin, and Belfast were 7, 6, and 4 respectively. Influenza claimed 4 deaths each in Birmingham and Middlesbrough, 3 each in Warrington, Leeds, and Rhondda.

The number of stillbirths registered during the week in the great towns was 278 (corresponding to a rate of 43 per 1000 births), including 58 in London.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

J. J. Benson, R. Russell, and J. Y. Woodhouse to be Surg. Lts.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lts. S. B. Borthwick to be Surg. Lt.-Commdr., and F. E. Stabler to *Victory*, for R.N. Hospl., Haslar, for training.

Surg. Lt. (D.) G. R. D. Hankinson to *Victory*, for R.N. Hospl., Haslar, for training.

Proby. Surg. Lt. H. P. Widdup to *Victory*, for R.N. Hospl., Haslar, for training.

ROYAL ARMY MEDICAL CORPS.

Capts. W. Millerick and E. O. A. Singer to be Majs.

Lt. (on prob.) H. W. Daukes, from the secd. list, is restd. to the estabt.

ARMY DENTAL CORPS.

Capt. H. J. Procter (Temp. Flight Lt., R.A.F.) to be Maj.

J. A. McKillop, W. A. McClelland (late Surg. Lt. (D.), R.N.V.R.), and W. B. Martin to be Lts.

TERRITORIAL ARMY.

Maj. W. H. A. D. Sutton, R.A.M.C., to be Divl. Adjt. 44th (Home Counties) Div., T.A., vice Capt. G. W. B. Shaw, R.A.M.C., who vacates the appt.

Capt. W. W. Hallchurch to be Maj.

Lts. P. Mumford, R. G. Addenbrooke, and T. H. Sansome to be Capts.

L. G. Llewellyn to be Lt.

ROYAL AIR FORCE.

Flight Lt. A. Briscoe is promoted to the rank of Squadron Leader.

INDIAN MEDICAL SERVICE.

Capts. J. G. Bird and Jal Edalji Dhunjibhoy to be Majs.

Lts. A. Rosenbloom, M. P. Conroy, W. J. Shipsey, and Chiranji Lal Pasricha to be Capts.

Temp. Lt. Prabhakar Narayan Gokhale relinquishes his temp. commn.

FREE MILK DAILY FOR SCHOOL-CHILDREN.—On Nov. 19th the Lancashire Education Committee approved a recommendation of the school medical subcommittee authorising the county medical officer to supply a pint of fresh milk on each school day to every child in Westhoughton schools who is suffering from malnutrition and whose parents are not in a position to provide the necessary nourishment; also to provide cod-liver oil and malt to children who require special nourishment. It is stated that to provide a child with a pint of milk on every school day will cost 55s. a year, and to provide for 10 per cent.—roughly the proportion regarded as suffering from some degree of malnutrition—would mean an expenditure of £32,000 for the county. To begin with, it is proposed to take one-eighth of the county for the three winter months. This will cost £1183, and it is proposed to spend roughly some £387 on cod-liver oil and malt.

GENERAL MEDICAL COUNCIL.

PRESIDENT'S ADDRESS.

AT the winter session of the General Medical Council which opened on Nov. 27th the President, Sir DONALD MACALISTER, began his address with a brief sketch of the place and function of the Council in the State.

The Council's Place and Function.

On Nov. 23rd, 1858, 70 years ago, said Sir Donald, the General Council of Medical Education and Registration first met, in the Hall of the Royal College of Physicians, pursuant to a summons by the Secretary of State. Sir Benjamin Brodie was elected the first President of the Council, and Dr. Francis Hawkins the first Registrar, and committees were appointed for the conduct of business, for registration, and for the National Pharmacopœia. It does not appear that the President delivered an opening or any other address to the Council. I have sometimes wished that this precedent had been followed by his successors. But it is recorded that in a dignified communication, with reference to a proposed petition by the Council to the Government of the day, he stated his view of the functions and relations of the new Council in these terms :—

"The Medical Council is appointed by Parliament to act in those matters which affect the medical profession, both on the part of the profession and of the public. It is not to be supposed that they have any interests of their own to serve; and it is as much out of their way to proceed by way of petition as it would be for the Board of Trade to do so. Where they conceive that any alteration is required in laws concerning the profession, it is their duty to represent this in the proper quarter, not as petitioners, but as coadjutors of the Government in one department of the public business."

That conception of the Council's place and function in the State has, Sir Donald remarked, been sustained, I think worthily, for 70 years; and it has underlain the several statutory changes which in the interval have modified in various ways the legal constitution and powers of the Council as a public body. I do not propose to survey these changes in retrospect, for they have not altered the essentials of the Council's statutory relations to the public or the profession. It remains the law-appointed guardian, in the public interest, of professional education and professional behaviour, the coadjutor of the Government in its own domain. The officers of the Council propose to celebrate the seventieth anniversary by a domestic dinner to present and past members, to be held during this session.

Some Recent Losses.

Death has been busy since we last met in May, said the President, and in a few words he set out the merits of some whose presence at their board would be missed.

Sir James Hodsdon passed away suddenly and untimely on his way home from our last session. An able and conscientious member since 1906, he had won the confidence of his colleagues for his zealous devotion to all the tasks that fell in increasing number to his share. Sober and cautious in judgment, his opinions were not hastily formed, and they carried the weight which always attaches to sincere and well-matured utterances. His long services to the Council and to the Scottish Branch will not lightly be forgotten.

Sir Arthur Chance also, brilliantly critical at times, but always helpful, contributed much during the last 13 years to the efficiency of our labours, and the interest of our debates. To his wisdom and foresight during the discussions on our relations with the Irish Free State, the working agreement which is now operative was largely due.

Sir Charles Tomes for 22 years was a Crown member of the Council, appointed in the interest of dental surgery. His scientific and professional eminence in that specialty, together with his wide knowledge in other branches and his competence in finance, gave him a unique place in our counsels. The Council for 16 years profited by his sagacity as treasurer during the difficult time of transition to our present building, and of complications due to the war. He also, as a trusted adviser of the Government, had much to do with shaping the Dentists Act of 1921, and of preparing the way for the devolution of certain of our duties as regards dentistry to the new Dental Board.

Sir Nestor Tirard was for only five years a Crown member of the Council itself; but his intimate connexion with its work on successive Pharmacopœias extended over 33 years. As secretary of the Pharmacopœia Committee he assisted in the editorial preparation and supervision of the issues of 1898 and 1914, and of the Addendum of 1900. I can speak, perhaps better than any other, of the capable and unselfish manner in which during that time he assisted me as chairman of the committee, and of the wide and varied knowledge of the subject matter which he acquired and applied to his duties. The British Pharmacopœia, 1914, of which he was senior editor, will remain as a monument to his mastery of pharmacopœial science and practice.

Sir Hector Clare Cameron has just died full of years and honours at the age of 85. One of the last survivors of Lord Lister's personal assistants and coadjutors—he has fitly been described as Lister's "beloved disciple"—he held a high place not only among Glasgow celebrities, but in the affectionate regard of the surgeons of the world. To myself his loss is irreparable, for from the time when in 1889 he first welcomed me to this Council as a colleague, until the end, he was my unfailing friend and counsellor, on whose kindly wisdom and manifold experience it was ever my privilege to draw.

New Members.

But while we miss and mourn these veterans, with grateful acknowledgment of what they were and did for us, we may be thankful, Sir Donald went on, that there is never wanting a supply of good and faithful men to take their places. Thus, in the room of Sir James Hodsdon, the Royal College of Surgeons of Edinburgh has appointed Dr. Alexander Miles, eminent as a surgeon and a surgical teacher in that famous school, honorary doctor of laws, and joint editor of the *Edinburgh Medical Journal*. And in the room of the late Dr. Macdonald, and of Sir Robert Bolam, transferred to the University of Durham, the registered practitioners resident in England and Wales have elected by overwhelming majorities Mr. Ernest Kaye Le Fleming, of Wimborne, and Mr. John Wardle Bone, of Luton, as their Direct Representatives on the Council.

India.

The President went on to speak of the relations with the Government of India, on the question of the recognition for practice in this country of Indian medical degrees. These are, he said, approaching a more stable and satisfactory position. A Bill for establishing an All-India Medical Council, which will exercise effective supervision over professional teaching and examination in the Provinces, having special regard to the external and central or non-provincial aspects of medical qualification, is now under discussion by the Central Legislature. And a proposal for the appointment in the meantime of a central Commissioner of Medical Qualifications and Standards has been approved by the Government of India and by the Provincial Governments. We may hope, therefore, before long to be able to conduct our negotiations and inquiries regarding the recognition of particular Indian degrees through a central Indian body or officer, whose reports we may accept as authoritative. It is much to be desired that the Commissioner appointed should be familiar with British standards of qualification, as well as with those current in India. For the essential consideration for the Council is the maintenance of substantial equivalence between the two. Our primary interest is, that recognised Indian medical degrees shall guarantee a standard of proficiency sufficient for practice in this

country. It is this interest, which we cannot forgo, that alone justifies our intervention in Indian medical education. In the meantime, the Executive Committee, after considering the reports received from the Indian universities (including Calcutta) concerning their progress in education and examination, have agreed to recognise their degrees for another year, subject to further inspection of their qualifying examinations during the current session, by inspectors appointed by the Government of India and approved by the Council.

New Zealand.

New Zealand has, by recent legislation, raised a question regarding reciprocity which is receiving serious consideration. Hitherto, New Zealand medical degrees, under an agreement of many years' standing, have been recognised for registration in this country on the condition that *all* medical practitioners of Great Britain were registrable without further examination in the Dominion. By an Act of the Dominion Parliament, passed without notice to the Council, such registration in New Zealand is in future limited to practitioners who hold a medical qualification granted in this country. If this limitation were accepted it would mean that New Zealand graduates registered in the United Kingdom would be free to practise not only here but in all the British Possessions and foreign countries with whom we stand in relations of reciprocity, but only *certain* practitioners on the British Register would have the like privilege in New Zealand. The Dominion Government suggest that a new arrangement might be made, by which the privileges of New Zealand graduates might be limited to the United Kingdom only. This would seriously affect the whole system of Imperial and foreign reciprocity which has been established under the Medical Act, 1886, and we are advised that it would require new legislation amending that Act. A memorandum on the subject has been prepared for submission to His Majesty in Council, who has power to declare whether the New Zealand arrangements can be regarded as "just" to the medical practitioners of the United Kingdom. If under the present law the new conditions are not held to be "just" it will be for the Privy Council to order that Part II. of the Medical Act, 1886, shall be deemed no longer applicable to New Zealand. It is probable that the opinion of the law officers of the Crown may be taken on the scope and bearing of the Act as hitherto interpreted. If it proves, Sir Donald remarked, that the Act does not admit the serious limitation proposed by New Zealand, the recent legislation in that Dominion will have to be amended, or New Zealand graduates must forgo the advantages of British registration.

The Pharmacopœia.

The proposals contained in the Report of the Committee on Civil Research, on the subject of the revision of the British Pharmacopœia, approved and adopted at the Council's last session, have been carried into effect by the Pharmacopœia Committee. A selection committee, consisting of members nominated by the Council, the Medical Research Council, and the three pharmaceutical societies, has been constituted, and has carefully considered the composition and membership of the Pharmacopœia Commission, to which the preparation of the draft Pharmacopœia will be entrusted. The Commission will consist of seven members, including a chairman, possessing expert knowledge of the several subjects and branches of pharmacopœial science—medical, pharmacological, and pharmaceutical. The several members will act as chairmen, and representatives on the Commission, of special subcommittees of reference to be appointed to deal with and make representations on the different departments of knowledge and practice concerned in the framing of the Pharmacopœia. In this way it is hoped, the President concluded, that the fullest information may be gathered, from a wide field of experience and science, and that the Commission will have at its disposal, and harmonise into a consistent and comprehensive whole, all that is necessary for the revision of the old and the preparation of the new British Pharmacopœia.

At the conclusion of his address a vote of thanks to the President was proposed by Mr. A. F. SINCLAIR and seconded by Sir NORMAN WALKER. The Council then passed to the consideration of penal cases.

APPOINTMENT OF THE PHARMACOPŒIA COMMISSION.

The Pharmacopœia Committee of the Council met on Nov. 28th. It was announced that the personnel of the Commission to whom the duty of preparing a new Pharmacopœia is to be entrusted has now been settled. It will be remembered that in May of this year (see THE LANCET, 1928, i., 1086) a report was issued by a subcommittee of the Committee of Civil Research, wherein it was recommended that a selection committee consisting of nominees of the G.M.C. (4), the councils of the Pharmaceutical Societies of Great Britain, of Ireland, and of Northern Ireland (3), and the Medical Research Council (2) should be charged with the duty of selecting persons to form a new body to be designated "The Pharmacopœia Commission." The members of the Selection Committee were Sir Humphry Rolleston (president), Sir Farquhar Buzzard, Dr. H. H. Dale, Sir Walter Fletcher, Mr. Leathes, Mr. Skinner, Mr. Neathercoat, and Mr. Edmund White, the last named having died before the committee had concluded its business. This representative committee has gained the consent of the following persons to serve on the Pharmacopœia Commission:—

Dr. A. P. Beddard, Consulting Physician to Guy's Hospital.

Mr. R. R. Bennett, F.I.C., Technical Director of British Drug Houses, Ltd. and Chairman of the British Pharmaceutical Conference.

Dr. J. H. Burn, Director of the Pharmacological Laboratory of the Pharmaceutical Society of Great Britain.

Dr. F. R. Fraser, Director of the Medical Professorial Clinic and Physician to St. Bartholomew's Hospital.

Prof. H. G. Greenish, D.Sc., Pharmaceutical Editor of the British Pharmacopœia, 1914; Dean of the School of Pharmacy.

Dr. J. A. Gunn, Professor of Pharmacology in the University of Oxford.

Mr. T. Tickle, F.I.C., Public Analyst to the County of Devon.

Documents and other accumulated information in the possession of the Pharmacopœia Committee will be placed at the disposal of the Commission, and it is hoped that no time will now be lost in carrying forward the process of revision, which has been in hand for some years.

Correspondence.

"Audi alteram partem."

BOOKS AS FOMITES.

To the Editor of THE LANCET.

SIR,—In a recent annotation (THE LANCET, Nov. 17th, p. 1036) you summarised the brief statement on the conveyance of infection by books, contained in the report of the Consultative Committee of the Board of Education on Books in Public Schools. This statement does not give any details of the recent work on the subject which has been devoted to the recovery of the specific streptococcus from fomites in cases of scarlet fever—*e.g.*, (*a*) U. Friedemann and H. Deicher (*Deut. Med. Woch.*, 1926, lii., 2147)[1] found the scarlet fever streptococcus in the walls, beds, curtains, and other objects used in the sick room of scarlet fever patients, and came to the conclusion that his results "underline the necessity of a thorough final disinfection of the sick room in a case of scarlet fever." (*b*) A. R. Balmain (THE LANCET, 1927, ii., 1128) found that in artificially infected books the *Streptococcus scarlatinæ* could survive for 18 days even in lightly infected books. (*c*) B. Fejgin (*C.R. de*

[1] See THE LANCET, August 4th, p. 216.

la Soc. de Biol., 1928, xcviii., 118) confirmed the latter's results. He also investigated books naturally infected with scarlatinal streptococci, and his conclusion was that "books handled by scarlet fever patients harbour the germs and are capable of contributing to the spread of scarlet fever. It is necessary to avoid all contact with these books for at least six weeks and even after this period it would be best to disinfect them." (*d*) The Ministry of Health's Pathological Laboratory (Chief Medical Officer's Report, 1928) found that:—

"In books used by 3 children out of 15 who sickened with scarlatina, hæmolytic streptococci were found. Books used by 12 children who developed diphtheria were also examined. In one instance virulent diphtheria bacilli were isolated."

It is impossible to prove that fomites spread such an endemic disease as scarlet fever, but at present the safest conclusion would be that stated at the discussion on the subject by the Society of Medical Officers of Health that in the light of uncertainty definite measures should still be taken to prevent the possibility of the spread of infection by this means. The legal position of a library which issued books which had been in the possession of scarlet fever patients would be an invidious one, if no precautions had been taken.

I am, Sir, yours faithfully,

A. H. G. BURTON,

Nov. 27th, 1928. Medical Officer of Health, Ilford.

A TUDOR ACT OF INDEMNITY FOR UNQUALIFIED PRACTICE.

To the Editor of THE LANCET.

SIR,—Those of your readers who saw the account of a Tudor Act of Indemnity for Unqualified Practice in your last issue (p. 1113) may like to know that Morfew is noted in Johnson's Dictionary as Morphew; morphea in low Latin meaning a scurf on the face. Du Cange says *est species scabiei*. Probably the term would be used to denote a large variety of dermatological conditions.

I do not know what "Saucelim" means; but Sir Arnold Lawson is, I believe, right in saying that "Webbe" is cataract. I believe the word "pin" is also sometimes used to denote cataract, but more frequently, perhaps, a speck or nebula of the cornea. When we remember that to the laity even to-day a corneal scar is frequently spoken of as a cataract, we can forgive our predecessors in the time of Henry VIII., for any mistakes of this nature.

I am, Sir, yours faithfully,

London, Nov. 23rd, 1928. R. R. JAMES.

To the Editor of THE LANCET.

SIR,—The report at p. 1113 of the discovery in the Muniment Room at New Romney Town Hall of a printed copy of the Statute 34 & 35 Henry VIII., c. 8, will no doubt bring you letters from many medical historians. The words undeciphered are all in one sentence, which reads after "rootes and waters" . . . "and the using and ministering of them to such as ben peyned with customable diseases; as women's brests beyng sore, a pin and the webbe in the eie," &c.

The Statute is directed not against all qualified practitioners, but only against surgeons, and the preamble is certainly a gross libel. It was only two years before that the barbers and surgeons had been made of one company by the Act 32 Henry VIII., c. 42, which defined the respective spheres of barbers and surgeons, and gave authority for the instruction of surgeons in anatomy. Why then this sudden attack on the whole body of surgeons? The answer is that the surgeons had unwisely pressed their powers of suing unlicensed practitioners. Thomas Gale, a member of the Barber Surgeons Company (he was Master in 1561), was very zealous in this direction, and in 1542 we find him suing unqualified persons for practising surgery, when all that they were doing was, or appears to have been, ministering rootes and waters in cases of women's breasts being sore, and for sore eyes and sore mouths "onely for neyghbourhood and goddes sake." Paper No. 1255 of the Collection of Letters and Papers of this year, 34 Henry VIII., contains an account of how

"Agnes Guy wyff of Thomas Guy was suyd ffor helyng of women's papes.

"Itm. Agnes Mason wydow was suyd for the same cause.

"Itm. Katryne Bownington wyf of Richarde Boonington was suyd for gyvyng water to yonge chyldren to hele cankers in ther mothes.

"Itm. John Margetson on of the Kinge's Majs. brewers was suyd for gyvyng water to clense mens yeese (eyes).

"All these persons were suyde in the guyldhall in London Sir Rolande Hyll Knyght beyng shereffe by Thomas Gale barber surgeon which persons and divers others be now in suyte agayne in the King's Bench for the same cause."

It was this troubling of "divers honest persons" which caused the pendulum to swing violently away from the movement of 1540, and so statutory permission was given for unqualified persons to undertake certain kinds of outward treatment which was part of the province of the surgeons. The herbalists got no authority by this Act to practise for gain, and they had to be careful to keep to the special diseases mentioned. So also had any physician, if he had not been licensed by the College of Physicians (see Butler's Case, Cro. Car. 256).

With regard to the diseases questioned: (*a*) "Pin" belongs to the next phrase, "Pin and web in the eye," a popular name for an opacity of the cornea; (*b*) "Saucelim" for "saucefleme," a swelling of the face accompanied by inflammation and pimples; (*c*) "Morphew," a leprous or scurfy eruption. James Cooke's "Marrow of Surgery" gives: "Alpha, called Morphew, great spots in the skin, changing its colour, joined with a certain roughness." He mentions two kinds, white and black morphew.

I am, Sir, yours faithfully,

FRED BULLOCK, LL.D.

Red Lion-square, W.C., Nov. 23rd, 1928.

PIN, WEBBE, AND MORFEW.

To the Editor of THE LANCET.

SIR,—The other day I sent you some extracts from my favourite pharmaceutical authority, the Countesse of Kent. This admirable woman was doubtless one of the leaders of those who gave of their "cunninge . . . to the poore people onely for neyghbourhood and goddes sake, and of pitie and charitie." She does not give a definition of Pin and Webbe, but she tells us plainly how to cure them.

For a Pin and Web in the Eye.—Take the white of an Egg, beat it to oyle, put thereto a quarter of a spoonful of English Honey, half a handful of Daisie leaves, and in winter the roots, half a handful of the inner rind of a young Hazle not above one yeares growth, beat them together in a Morter, and put thereto one spoonful of Womans Milk, and let it stand infused two or three houres, and strain all through a cloth, and with a feather drop it into the eye thrice a day.

Again:

For a Pin or Web in the Eye.—Take two or three Lice out of ones head, and put them alive into the eye that is grieved, and so close it up, and most assuredly the Lice will suck out the web in the eye, and will cure it, and come forth without any hurt.

Pin and Webbe almost certainly referred to corneal ulcers of various kinds, one prescription is for "a Pin and Web, and rednesse of the Eyes." "Morphew" is fully described as "A yellowish scurfy matter that lodges within the skin upon the upper part of the faces of many women while they are with child and some young children."

I am, Sir, yours faithfully,

H. CAMERON KIDD.

Emsworth, Hants, Nov. 23rd, 1928.

To the Editor of THE LANCET.

SIR,—The diseases mentioned in the Tudor Act of Indemnity for Unqualified Practice in your issue of Nov. 24th may be indicated from the following.

words found in the "Canterbury Tales": (a) *Pynen*—to torment, hurt, &c.; "pin" is possibly derived from this verb. (b) *Sawcefleem*—pimply, spotty, &c.; saucelim may be derived from this adjective. (c) *Morman*—ulcer, sore, &c.; morfew may be akin to this. Describing the Cook in the Prologue:—

"But greet harm was it, as it thoghte me,
That on his shine a morman hadde he."

I am, Sir, yours faithfully,
A. G. G. THOMPSON.

Brixton Hill, S.W, Nov. 26th, 1928.

A CORONER ON UNQUALIFIED PRACTICE.

To the Editor of THE LANCET.

SIR,—Your medico-legal correspondent set out last week the remarkable facts revealed at an inquest on the body of an old man who had died of cancer after being treated by an unqualified practitioner. The story shows the familiar features of credulity on the part of a suffering patient, and that blend of confidence, ignorance, self-deception, and rapacity which is common to most successful unqualified practitioners. It is rather the coroner's comments that will occasion surprise. The practitioner of medicine is well enough aware that in the average lay mind unorthodox treatment is regarded with a respect often withheld from the recommendations of his own profession. There are among the public many individuals, even among the well informed, always ready to credit the stories of miraculous cures so long as these are obtained at the hands of people who have made no study of medicine or surgery. What I was not prepared to find is a coroner apparently doing his utmost to justify and support this kind of mistaken confidence. I should have thought that a coroner in the course of his experience would arrive at the true estimate of pretentious unqualified practice. I should expect him to have some understanding of the false hopes which these people inspire and the unfair emoluments which they abstract from the credulous. I should expect him to know that, although the genuine medical man often makes mistakes, they are trivial in number and in degree compared with the colossal blunderings of the quack. In this case, at any rate, such natural expectations would be disappointed. The coroner in question was impressed by the list of names of patients who had consulted the quack, "a very distinguished list" he observed. "Have you cured cancer by the same method which you attempted on Mr. C.?" he asked. The answer was "Yes, I have cured many terrible diseases by my methods." The list and the answer were enough. The quack, he pointed out, was a "well-known man," and had been consulted by a "great many well-known people." "One cannot shut one's eyes to the fact that in many cases cures have been made by persons outside the medical profession." A coroner who makes a solemn pronouncement of this kind ought to be prepared to relate the cases and show that they were indeed cures. Perhaps he is prepared to do so. Incidentally, I should like to hear his pronounced opinion on a qualified medical man who charged 15 guineas for one consultation at his house, and two packets of cane-sugar sent by post.

I am, Sir, yours faithfully,
J. BLOMFIELD.

St. Mary's Mansions, W., Nov. 22nd, 1928.

ALLERGIC DISEASES.

To the Editor of THE LANCET.

SIR,—In the paper by Dr. Oriel and myself, published in your last two issues, no reference was made to Dr. James Adam's book on Asthma or to the writings of Haseltine and La Forge. This was a very serious omission for which I am alone responsible, and I should like to express my regret to Dr. Adam in your columns, as I did privately, when I read his book some weeks ago, by which time our paper was already in the proof stage. Not only do the observations of Dr. Adam and of his followers confirm very largely the conclusions at which Dr. Oriel and myself have independently arrived, but in his chapter on the blood and urine Dr. Adam records some biochemical investigations, made for him by Mr. John Middleton, which anticipated some of our findings. The literature concerning allergic diseases is so vast that no attempt was made in our paper to present a complete review of it, but I am more than sorry that I should have omitted to pay tribute to Dr. Adam's invaluable pioneer work.

I am, Sir, yours faithfully,
H. W. BARBER.

Devonshire-place, W., Nov. 26th, 1928.

AN EXPIRATORY VALVE.

To the Editor of THE LANCET.

SIR,—May I venture to suggest that the valve for anæsthetic administration, described by Dr. C. Langton Hewer in THE LANCET of Nov. 17th, would have been greatly improved by the incorporation of a fitting which I described in your columns[1] five years ago—viz., a tube from the expiratory valve to lead away the expired gases? With this "exhaust-pipe" connected to a suitable tube leading to any convenient window, one of the chief objections to the use of ethylene is removed, as, if the mask fits properly, the somewhat objectionable smell of the gas is not perceptible in the operating theatre.

I am, Sir, yours faithfully,
R. J. CLAUSEN.

Wimpole-street, W., Nov. 22nd, 1928.

"FEE-SPLITTING."

To the Editor of THE LANCET.

SIR,—In my recent law case to which Dr. O'Connor made reference he stated that in my evidence that I said that patients were sent to me by many leading specialists and that we shared the fees. I did say that my patients were sent to me by many eminent medical men, but I did not say (neither was it even reported in this connexion) that we shared the fees, which would have been untrue. I have never shared any fees at all with any single medical man in my life. In connexion with the proposed rejuvenation partnership for joint treatment with a particular person, there was a question of sharing fees. But this statement which I made in this connexion had nothing whatever to do with my curative treatment which I give to patients sent to me by medical men in the ordinary way. In order to refute the idea that preoccupation with what was called the "golden vision" had, or would have, upset plaintiff's cure, I told the judge that it was not to be a rhythm partnership or interfere in any way with my usual treatment—that I was to give the physical exercises at the Radiant Health Institute for rejuvenation in the same way as I did to patients sent to me by medical men, mentioning three distinguished names.

Referring to your statement appended below Dr. O'Connor's letter that I admitted in my evidence that these three distinguished medical friends were to send rejuvenation patients and share in the fees, such a statement was never made in court and I cannot see anything that was reported to convey such an impression though the sharing the fee statement in connexion with rejuvenation scheme was placed in the report in the wrong order. Naturally only a fragment of my evidence was given. But I should like to make it clear that these three men knew nothing about the rejuvenation scheme.

I am, Sir, yours faithfully,
ANNE WALTON.

Radiant Health Institute, Wigmore-street, W., Nov. 24th, 1928.

[1] THE LANCET, 1923, ii., 938.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

LOCAL GOVERNMENT BILL: MINISTER OF HEALTH'S EXPLANATION.

IN the House of Commons on Monday, Nov. 26th, Mr. CHAMBERLAIN, Minister of Health, in moving the second reading of the Local Government Bill, said that when they considered the magnitude of the changes which the Bill proposed, the variety of the interests which it affected, and its possible results upon the prosperity of the country, and indeed the social welfare of the whole community, he thought it must be reckoned among the greatest measures which had been presented to any Parliament for many years. It contained the final and completing stage of that great measure of rating reform, the earlier stages of which the House had already discussed in the Finance Bill and in the Rating and Apportionment Act of last session. Like most of our national institutions, local government had been a product of a process of evolution. Progress had been fitful and irregular. There had been moments of expansion and development, then there had been long intervals when it seemed to fall almost into a condition of somnolence. Everyone of these movements, if it was examined, would be found to have been a movement in the direction of the further expansion of the functions of local government and of their adaptation to the changing needs of the people, as the public conscience demanded that the standards of life should be raised, and as the community assumed further responsibility in respect of the health, the education, or the security of its members. If they looked back over the history of the last hundred years they saw standing out a succession of great measures which were, as it were, the crests which in turn they had surmounted as they had progressed upon the upward wave. Each of these measures represented the accumulated experience of the preceding years, and showed how it was necessary to adapt the conditions of local government to the altered conditions of the locality. After describing the scope and effect of the Poor Law Act of 1834 and later measures dealing with local government, including the Acts of 1888 and 1894, Mr. Chamberlain said that since those two Acts there had been no serious or radical attempt to reform local government. Yet they must consider what gigantic changes had taken place since then. The population of England and Wales had increased from 29,000,000 to 39,000,000, and its distribution had altered very considerably. New industries had sprung into existence, and older industries, some of them among those which seemed the most stable and permanent that we had in this country, withered and decayed. New services had been developed, and the expenditure of local authorities had gone up from about £36,000,000 in 1891 to nearly £250,000,000. The means of communication had been enormously facilitated by the development of the telephone. By the invention of the internal combustion engine, its perfection, and its adaptation to motor vehicles, the means of transit and transport had been so revolutionised that distances which in the old days took a whole day to travel might now be done in the course of an hour. All these things profoundly modified local conditions throughout the country, yet there were the same local authorities, the same areas practically as they were. It would be a miracle if it were not found that this stereotyping of the old conditions of government had not resulted in widespread friction, in widespread loss of efficiency, and inability to perform the functions which were given to them in such different circumstances. He could not imagine that there was any member of the House who had a greater belief in or admiration for our system of local government than he had. But it was just because he had seen for himself what local government could do, what he thought it ought to be; because he knew how many places there were in the country where it did not reach to the highest ideals, but where he would like to see them come up to it; because to his mind local government reform meant social reform, that he rejoiced that that day the opportunity had been given to him to bring forward this measure, which would, he believed, effect great reforms in bringing up the standard of the backward authorities somewhat nearer to what they ought to be.

Obsolete Points in Local Government.

During the four years that he had sat in the chair of the old presidents of the Local Government Board it had been borne in upon him with ever-increasing force that splendid as was our system of local government, it was to-day in many respects obsolete and out of date. Sitting there at the centre of things he could see the cracks and flaws in the machine, he could note how in one place the load had been growing and growing until it had become far greater than the shaft was originally designed to hoist. In another place he could see remnants of old gears designed long ago which now only served to weaken and hamper the working of the more modern plant. It seemed to him that local government to-day cried aloud for reform, and in this measure they had a great scheme which was divided into various parts, some of which perhaps might seem to have little reference to one another, yet they were all parts of a whole, and in their turn each of them would do something to oil the wheels to ease the way, and to bring up the output of the machine both in quantity and quality to something far superior to what they were able to get to-day. The measure would have to be thoroughly and critically examined, but before they could examine the remedy it was necessary to diagnose the disease. He would like to lay before the House what seemed to him to be the main defects from which local government in this country was suffering to-day. These might be considered under five main heads. Firstly, the continued existence of the guardians among other local authorities with functions which overlapped one another, and presiding over areas the boundaries of which crossed the boundaries of the other local authorities, giving rise to confusion, to waste, and to inefficiency. Secondly, he would put the onerous charges which were fastened to-day upon county districts, and particularly the rural districts, in respect of the construction and maintenance of the modern types of roads which more and more were coming to be used for traffic which was of no direct benefit to the immediate locality, but which was passing through it. Thirdly, he would put the want of elasticity, the want of power readily and cheaply, to alter the boundaries of the districts themselves as their conditions change and the nature of the authority which administered them. Fourthly, he put the inequitable system of rates which had under modern conditions been subjecting our agriculture and industry to a slow process of strangulation; and fifthly, and lastly, he would point to the present chaotic conditions of the relations between national and local expenditure—the system under which national contributions to local needs too frequently meant that it gave in largest measure to those who had least need of it, while those who could not afford to maintain their own services got the smallest contribution from national resources.

Fluctuation and Overlapping.

The trouble with the poor-law was the same to-day as in 1834 in respect of the fact that the charges for poor-law, which fluctuated violently from time to time and which were largely beyond the control of the authorities which had to meet them, fell upon areas so small that the burden was apt to become suddenly and completely crushing. Of course, the inequalities would not be diminished, but increased by the proposals of the Government for de-rating, which would abstract from those authorities a large part of their rateable value and leave only a diminishing portion of it to bear any fluctuating charges which remained. That was not the only anomaly. Surely it was altogether indefensible that, say, in the area of a county borough the finance committee of the council, which ought to be the sole authority for the public finances of that borough, had to take account of an expenditure over which it had no control whatsoever—the expenditure of a body separately elected at elections at which only a very trifling proportion of the ratepayers could be induced to vote, and an expenditure which might, and often did, amount to 10 per cent. or more of the total expenditure of the town. Lastly, there was the question of overlapping. From time to time Parliament had entrusted the major local authorities with the responsibility for the prevention or the treatment of various diseases. There was tuberculosis, there was the charge of lunatics and mental deficients, there were the great maternity and child welfare services; and yet every one of those things had to be dealt with also by the guardians in the discharge of their duties, and they had this remarkable and paradoxical circumstance—that the question of whether a person should receive treatment at the hands of the county borough or the county council, or whether he should receive it under the poor-law from the guardians, depended not upon the nature of the disease or of his infirmities, but merely upon whether he was destitute or not. They might suppose from some of the criticisms that had been made in the country that the proposal to abolish the guardians and transfer their functions to councils of counties and county boroughs was his invention. He could not claim the authorship of any such idea, but he might say that he had inherited it. In 1888, when the Local Government Bill was under discussion, Mr. Joseph Chamberlain called the attention of the House to the omission from the Bill of any proposal to hand over to the county council the functions of the guardians. If Conservative governments had lent a more ready ear to the counsels of his forebear it would have saved his son a world of trouble. Both the Majority and Minority Report of the Poor Law Commission of 1909 concurred on this point, that the time had come to abolish the boards of guardians and to hand over their functions to the county councils and the county borough councils. The Maclean Committee in

1918 again unanimously concurred in this one recommendation. While everybody would feel a considerable amount of sympathy with the men and women who had given long years of devoted voluntary service to the work of boards of guardians, and who naturally would feel regret at seeing the boards broken up and the possibility that they might have to give up that work, he did not believe that from any responsible quarter in the House there would come any serious challenge to the proposal which they found in the first part of the Bill. The case did not depend merely upon the easing of the financial burdens, strong as it might be on that ground. It opened up a wide field for the improvement of our health services. The whole trend of practice in modern medicine and surgery was towards the treatment in many cases in institutions where there could be accumulated the specialised equipment and specialised skill which were not always available in private homes. When this Bill became law they would have a position in which there would be one single health authority in each area whose duty and function it would be to survey the whole institutional needs of that area. They would have at their disposal all the institutions which were now in the hands of the guardians; in many the accommodation was not fully occupied. They would have an opportunity of reclassifying their institutions, of closing such as were no longer suitable for modern requirements, of altering and adapting others, and using one for one purpose and another for another purpose. Even to-day there was a certain amount of classification attempted in many of the institutions of the guardians, particularly in the large areas, but he thought it must be clear that with the small opportunities that were to be found of each particular kind of case in any particular institution, it was quite impossible either to get the sort of classification that one wanted, or particularly, to bring to it that equipment and that specially skilled staff and nursing which were essential if one was to get the best results. He had taken out the particulars and the nature of the persons who happened to be in one particular institution on one night this month. He had chosen the institution at random, except that it was one in a rural area. This institution contained 7 acutely sick persons, 55 infirm and senile, 6 epileptics, 8 certified lunatics, 18 certified mental deficients, 9 uncertified mental deficients, 1 able-bodied man, and 3 healthy infants. No one could consider that that was a satisfactory state of things. It was clear that only a general review over comparatively large areas and a general readaptation of buildings would suffice if they were to get a satisfactory solution of that problem.

Incomplete Break-up of the Poor-law.

A certain amount of criticism had been directed to the point that the Government were not breaking up the poor-law. Under Clause 4 the county councils and county borough councils were given power to treat persons either under the poor-law or under a number of special Acts. If they adopted these special Acts, persons treated thereunder would be separated out and treated by other committees, according to the nature of their ailments. He was disposed to think that some day this should be made mandatory, but they were, at present up against two difficulties. In the first place, the local authorities were very jealous of their independence. There was a second and perhaps even greater difficulty—namely, that in many cases the councils had not sufficient institutions to be able to break up the poor-law. That, however, would come in the future, and no doubt this Bill would help it to come. How were these transferred functions to be dealt with? Of course, it was essential that the body which provided the money should retain financial control. At the same time he had been extremely anxious, and had taken some trouble to provide, that they should not so far as possible lose in any degree that local knowledge, that local interest and local experience that had been so valuable in the past, and in Clauses 3 to 7 there were provisions which showed how they were going to try to combine central financial control with the fullest possible use of that local knowledge. They had taken pains to insert in the Bill a provision that among the co-opted members of the public assistance committee must also be women. There could be no doubt that these committees would rank among the most important appointed by the council. The right hon. gentleman proceeded to describe the functions of the public assistance committees, and the subcommittees, which he said would be called guardians committees. He went on to say that Clause 13 provided for the recovery of expenses. The reason for inserting that clause was this. Under the existing law it was the duty of the guardians to recover either the whole or part of the cost of relief of any person who was maintained in their institutions. It was not the law that a local authority must do it, though some of it frequently did, and he thought that in the case of maternity homes they always did; but, obviously, if they were to transfer the functions of the guardians to the council they must not have a situation in which one person who happened to be destitute would have the cost of relief demanded from him, while another person who was not destitute, but who went into an institution of his own accord, was to be let off. They must have one rule for both, and for that reason they had provided that in future the local authority would have the duty imposed upon it of recovering such part of the cost of maintenance in an institution as any inmate could afford. But they excepted from that provision the case of the infectious hospitals, where persons went for the good of the community; and that also included the case of the tuberculosis sanatorium.

Protection of the Maternity Services.

He noticed from the amendment paper that this was taken as involving some danger to the maternity services. At present he did not see how that could be the case. It was the general practice of local authorities to make charges for relief given in an institution, and seeing that the woman who had her confinement in an institution was relieved of the cost of doctor or midwife and that she had in most cases the maternity benefit secured to her, it was difficult to understand why she should not be asked to make some contribution to the cost of her maintenance in the institution. He had an open mind on the subject. He was anxious that nothing should be done that would in any way hamper or check the development of the maternity services, to which he attached the utmost importance, and if he could be convinced in committee that the provision here would have that effect, or that any amendment could usefully be inserted which would still further protect the maternity services, he would receive any such suggestion with respectful consideration. Referring to Part 2 of the Bill, which deals with registration services, Mr. Chamberlain said that these clauses were not consequential upon the great scheme of reform of the Government, and they might be omitted from the Bill without damaging the rest of it, but he thought that perhaps the House would feel that the registration services need not on this occasion be made a matter of controversy, and that perhaps they would be glad to lend their aid towards putting them on a basis which would be more satisfactory to them, and which would give them a better service in the future.

Clause 48 was designed to bring together education authorities and maternity and child welfare authorities. Obviously it was desirable that there should be continuity in the life of the child and where, as was the case at present, they had one authority which had the maternity and child welfare centre under its care, and other authorities which were education authorities who had no power to deal with maternity and child welfare, it was provided by the Bill that the maternity and child welfare services might be handed over to the authority which was also the education authority, so that continuous supervision might be exercised over the health of the child. Clause 50 provided in certain cases for the supervision of midwives; Clause 51 provided for a more satisfactory review of accommodation for infectious diseases in counties; and Clause 52 provided for power in London to delegate in future certain functions from the London County Council to the metropolitan borough councils.

Financial Provisions.

Proceeding to deal with the financial provisions of the Bill, Mr. Chamberlain asked what they were to put in the place of the present system of distributing national contributions? As far as he could see there were three ways open to them. The first was to take certain services right out of the purview of the local authorities, make them a national charge, and put them under national administration. That course was condemned by Mr. Lloyd George in 1912. To begin with it meant the apotheosis of bureaucracy; the creation of a new horde of officials from one end of the country to the other whose duties would overlap, and in some cases conflict with those of the local staffs. It would mean that it would be really impossible to separate the able-bodied unemployed from the ordinary person who was an applicant for poor relief, for one class constantly passed into the other. A plan of that kind would utterly fail to solve the present problem. It took no account of the relative wealth or poverty of different districts; it took no account of the differing needs of different services or of the differing costs of those services in different localities. The second course was to take the local expenditure as the basis for determining what should be received from the State. He turned that plan down at once because that was the very principle which, broadly speaking, was to be found in the present system of distribution and which in conjunction with other circumstances had brought about the necessitous areas. It was not a possible solution of the problem in front of them. There remained only the plan upon which the Government stood—namely, that national contributions to local services should be distributed, not in accordance with what the local authorities spent, but with what were their needs. The needs, of course, must include their relative ability to pay, and he submitted that that was not merely the only equitable solution, but that it was the only one

which was going to find a practical remedy for the ills from which local government was suffering to-day. He had been very much astonished at suggestions made in quarters, whose sincerity he did not for one moment question, that a system of block grants was going to injure, or even sometimes it was said to starve the health services, and especially the maternity and child welfare services. If he thought for a moment that that would be so he never would allow it to go through, but he was convinced that those fears were utterly groundless. It was the greatest mistake in the world to think that a percentage system always resulted in achieving the ends which those who started it had in view. There were many cases to-day of localities which were comparatively wealthy, but which would not accept the bribe which was offered to them by the Government, because they did not want to put up their rates. There were other cases of localities which would gladly extend their services, but which could not, even with the aid of the 50 per cent. given by the Government, afford the money which was necessary. So again they got discrepancies between different towns and different localities which arose out of the percentage system. Here were some figures showing what was happening to-day. He should explain that leaving out of account three or four wealthy towns which had an exceptionally high expenditure upon this particular service, the average grant received by the authorities throughout the country from the Government in respect of their maternity and child welfare service was about 5*d.* per head of the population. He took one or two towns which were under the average, and which were therefore not getting the average maternity and child welfare service. First there was Oxford, a comparatively wealthy place with nearly £8 10*s.* rateable value per head of the population. Its maternity and child welfare grant to-day was 4*d.* What would it gain under the scheme? The gain in the first five-year period would be 26*d.* and the final gain when the full formula came into operation would be 31*d.* per head. He would take an entirely different case, that of Merthyr, whose rateable value was only £2 6*s.* per head. The maternity and child welfare grant was 4½*d.* The gain in the first quinquennium would be 73*d.* per head, and when the final formula was in operation it would be 108*d.* Dudley had a rateable value of £3 5*s.* per head; its maternity and child welfare grant was only 2·3*d.* per head; in the first quinquennium it would gain 65*d.* per head, and in the final operation of the scheme 124*d.* Tynemouth was a case where there was special need: the rateable value was £4 1*s.*, and the maternity and child welfare grant was 3·8*d.* The gain in the first quinquennium would be 162*d.* and when the final scheme became fully operative, 206*d.* per head.

Adequacy of the Provision.

If the House would compare these figures of the gain per head with the amount that was being spent on maternity and child welfare service to-day, which on the average for the whole country was 5*d.* per head, was it not perfectly clear that the formula would give ample resources to every locality to deal with this service and to multiply it many times? There could not be any question about the adequacy of the amount of money for the service. After all, this was not an expensive service, and it did not take much money to produce considerable results. He had taken a good deal of trouble to protect it in the Bill. In Clause 75 it was provided that in the case of county districts voluntary associations would get, in addition to the population grant, an increased grant in order to enable them to carry on the service. Again, under Clause 83 the voluntary associations were protected, because the scheme which had to be prepared by the local authorities showing the amount of contribution which would be given to them had to receive the approval of the Minister, and he had the final say as to what the amount of the contribution might be. Then it might be said: "It is true you are going to give these ample resources to the local authorities, and they will have little excuse for neglecting this service, but unfortunately some local authorities are backward, they may be interested in other things, and they may not care to spend money upon this service which so many of us think so vital." He asked people who took that view to look at Clause 86, where they would see that the Minister had power, such as he had never had before, to take away the grant, or that portion of the grant which he might think right, from any local authority which was not keeping up this service to an adequate extent. That power would enable him to exercise far more influence to see that this service was kept up to the mark than he had ever had before. Here, again, if in the course of the discussions in Committee any good reason could be shown why the clause as drafted give insufficient protection to local authorities, or rather to this particular service, he was ready to consider any amendments put forward. There was no service to which he personally attached more importance and in which he took a greater interest than maternity and child welfare, and he was not going to allow any consideration to interfere with the fullest possible development being afforded to it.

Concluding his speech, which occupied nearly two hours and a half in delivery, Mr. Chamberlain said: I venture now to make one prophecy. It is that this scheme of local government reform, although it may well be altered in its details and in its passage through this House, yet in its main outlines it will hold the field—(cheers)—and that in the fullness of time it will take its place on our Statute Book as a courageous, comprehensive, and a successful attempt to remove anomalies and injustices which have too long been allowed to impair and weaken the magnificent structure of our local government. (Loud prolonged cheers.)

Medical Members and the Local Government Bill.

The members of the Parliamentary Medical Committee, which includes members of all parties, met at the House of Commons on Tuesday, Nov. 27th, for the purpose of considering the effect of the Local Government Bill on medical questions and health services. The discussion was directed mainly to the question of how the medical services affected by the measure can best be maintained and developed. A number of points were raised, and the committee were not all agreed in their views. Eventually it was decided that it would be desirable to adjourn the meeting in order that members of the British Medical Association might attend. It is expected that another meeting, at which representatives of the British Medical Association will be present, will be held next week, when an effort will be made to go very thoroughly into the medical aspects of the Bill in preparation for the Committee stage.

OFFICES REGULATION BILL.

In the House of Commons on Wednesday, Nov. 21st, Miss WILKINSON asked leave to bring in a Bill to regulate offices and the employment of young persons therein. She said that the Bill was introduced by her last session and obtained the unanimous approval of the House. She appealed to the Home Secretary to use his influence in order that the Bill might be regarded as non-controversial, because anyone who read its extraordinarily moderate provisions, and who realised the great need which it was intended to meet, would feel that it was inconsistent with their duty as responsible members of the House to oppose the measure. She had been astonished at the number of letters which she had received from all over the country giving particulars of the conditions under which women in particular, but men also, had to work in offices. It was frequently forgotten that there was no protection, apart from the local sanitary by-laws, covering workers in offices. They were outside the factory legislation and the Shops Acts, and they unfortunately were a class who were not very highly organised. The grievances were getting steadily worse with the overcrowding in great cities, and the position was aggravated by women coming into offices which were never built to accommodate both sexes. The danger to health which came from bad ventilation was well known, and in a large number of offices, not only the older ones, but also those recently built, there was no ventilation, and the conditions towards the end of the day became very bad indeed. Among the letters she had received there was one which referred to one of the most modern office buildings in Regent-street. The office was underground, and artificial light was necessary all day. The worker in this case contracted anæmia, and had to be warned by her doctor that if she continued to work underground she was in danger of suffering from pernicious anæmia. The Bill was very moderate in its provisions; it took into account the fact that it was not possible to reconstruct all offices in the course of a year, and it gave wide powers to local authorities. It put the onus on the owner, who was often getting very high rents.

Leave was unanimously given to introduce the Bill, which was brought in and read a first time.

MOTOR VEHICLES INSURANCE.

Mr. WARDLAW-MILNE asked leave to introduce a Bill to make it obligatory upon owners of motor vehicles to be insured against third party risks.

Leave was unanimously given to introduce the Bill, which was brought in and read a first time.

HOUSE OF LORDS.

TUESDAY, NOV. 20TH.

WASHINGTON EIGHT HOURS CONVENTION.

The Earl of LYTTON moved—

That in the opinion of this House it is desirable (1) that the Government should inform the International Labour Office at Geneva of the precise points on which they desire a revision of the Washington Eight Hours Convention; and (2) that the Government should publish the text of a Draft Bill showing what modifications, if any, in the existing industrial agreements in this country would be required as a result of the ratification of

an International Eight Hours Convention in the amended form desired by the Government.

He said that he was not asking the Government to change their policy in any respect, or to ratify the Convention, but merely to define their policy. The situation was one in which everything was to be gained by complete frankness, and any vagueness or reticence could only cause suspicion and criticism. He had no doubt of the sincerity of the Minister of Labour and the Government in this matter, but they must not be surprised if their reticence and hesitation caused doubt in the minds of others.

Lord OLIVIER, on behalf of the Labour Opposition, supported the motion. He urged that the Government should make plain at once what their difficulties were in regard to the ratification of the Convention. Their silence on the subject created the greatest possible suspicion that pressure had been exercised from one side of the industrial world—namely, the National Federation of Employers' Organisations. The International Federation of Trade Unions, and the majority of the delegates from all the Governments represented at Geneva, were satisfied that the Convention was workable.

The Marquess of LONDONDERRY (First Commissioner of Works) said the only point of honour was that the present Government, and every other Government of this country, must maintain and promote the application of the general principle of the eight-hour day or 48-hour week "so far as special circumstances permit." He could not believe that any general accusation of dereliction of duty on this head could be made against this country, or any of its Governments since the Treaty of Versailles was signed. The 48-hour week had long been an accepted principle in this country, and was the general basis on which our industrial employment rested. He was not sure that we could not claim to have been the first great industrial country to see its establishment. When, however, the Government came to examine the possibility of applying the provisions of the Draft Convention to British industry, with a view to ratification, it became clear that serious practical difficulties were involved; so serious, in fact, that the Government felt that they would not be justified in ratifying in face of them. The Governing Body of the International Labour Office had called for a report on all the Conventions adopted at Washington, and it was understood that the first report to be presented would be that on the Eight Hours Convention towards the close of this year. The Government had invariably made it clear whenever the subject of revision had been raised that they had no desire or intention to impair in any way the principle of the 48-hour week. Their desire was merely to render the Convention an instrument under which uniform practice and enforcement would be assured by removing its ambiquities and by making provision for various industrial practices which were in no way opposed to that principle. To publish at this stage the precise modifications which they proposed for their declared purpose would be altogether premature. The report on the working of the Convention was not yet to hand, and the Government could not bring forward its final proposals in advance of that report and of any international discussion thereon. It was quite out of the question to bring forward a Bill to give effect to the Government's proposals with regard to the Convention. Such a step would crystallise their proposals in such a way as to leave little, if any, scope for subsequent international negotiations, and would undoubtedly lay them open to the charge of attempting to force the hand of the General Conference and to dictate decisions to it in advance.

Viscount CECIL OF CHELWOOD said the Government could not expect agreement to be reached between the various parties concerned in this matter until they had made up their minds as to what it was they wanted.

The motion was negatived by 39 votes to 17—Government majority 22.

THURSDAY, NOV. 22ND.

PROTECTION OF ANIMALS (AMENDMENT) BILL.

Lord BANBURY OF SOUTHAM moved the second reading of the Protection of Animals (Amendment) Bill, which amends Section 3 of the Protection of Animals Act, 1911. That section provided :—

> If the owner of any animal shall be guilty of cruelty within the meaning of this Act to the animal, the Court, upon his conviction thereof, may, if they think fit, in addition to any other punishment, deprive such person of the ownership of the animal, and may make such order as to the disposal of the animal as they think fit under the circumstances.

In the present Bill he proposed to add the further amendment :—

> Further, if the owner of any dog shall be guilty of cruelty to that animal within the meaning of this Act, the Court upon the owner's conviction thereof, may, if they think fit, in addition to any other punishment, direct that such owner shall not the matter for such time as they may direct, be granted any dog or for keeping a dog or dogs, and a direction so given shall be effectual to prevent such person so convicted from holding such licence.

The whole clause was permissive. It gave power to the magistrates to do certain things if they thought fit.

Lord DAWSON OF PENN said while sympathising with the suggestion of Lord Banbury he thought that the difficulty of adding a provision like this was brought home when one realised that a number of terms were defined in Clause 15 of the original Act. For instance, the expression "domestic animal" was defined as well as the expressions "animal," and "captive animal," and "horse." Yet it was remarkable that there was no definition of "cruelty." He suggested that words should be added to define "cruelty" in view of the controversies that had been going on of late as to what was cruelty in connexion with experimentation on animals. A small paragraph might be added defining "cruelty" as "pain inflicted wantonly and heedlessly," which he believed was a definition supported by considerable authority.

Lord DESBOROUGH said while they must all feel great sympathy with Lord Banbury's object in introducing this Bill, there were certain features of it which would make it in the opinion of the Government almost impossible to carry it out. And even if it were carried out, it could be so easily evaded as to make the Bill practically inoperative. Licences were issued at 12,000 money order offices, and the Post Office were of opinion that it would be impossible to issue notices to all those offices of people who were disqualified by the magistrates from taking out a licence. It would also be easy for a disqualified person to get some relation to take out a licence if he wanted to keep a dog. The Government would not oppose the second reading of the Bill, but they could not hold out any hope that they would give it in its present form any great facilities in the future. If, however, it could be so amended as to make it feasible and practicable they would be glad to see it passed.

Lord BANBURY said he would consult with Lord Desborough and the Home Office as to methods by which the Bill could be amended. He had drawn the Bill so that they could not go into the question of cruelty, and had limited it to the enlargement of Section 3 of the Protection of Animals Act, 1911. He hoped that no attempt would be made to bring in other matters.

The Bill was read a second time.

PRESERVATION OF INFANT LIFE.

Lord DARLING moved the second reading of the Preservation of Infant Life Bill. He said that it was brought to his notice by one of His Majesty's judges early this year that there were a good many cases—far more than he himself would have thought likely—in which no punishment could be awarded to a person who had done a very cruel and wicked thing in killing a little child. If a child were fully born, and had a separate existence from the mother, to kill it would be murder. But if it had not yet got an absolutely separate existence, it might be killed and that was no offence at law. It did not come within the law which prohibited the procuring of abortion, because the child had gone beyond the stage at which that applied. There was no doubt that that gap in the law required to be filled. The subject had been carefully considered by a Select Committee to whom it had been referred after the previous Bill, which he introduced, received a second reading, and the present Bill was really their Bill and not his.

Lord ATKIN said the Bill in its present form was not a satisfactory piece of legislation. The gap in the criminal law which had been mentioned by Lord Darling undoubtedly existed, and had been recognised to exist by many generations of judges. To the logical mind of the criminal reformer it could not be said that the killing of a child which could not be proved to have had a separate existence was not a wrongful act, and that it might not properly be made an offence. But the practical effect of making it an offence would in his experience be very small indeed. Their Lordships would appreciate the circumstances of a trial for infanticide of a girl, who was nearly always an unmarried girl, and who, as happened in nearly every case, had given birth to a child for the first time. After a period of months of mental care, anxiety, and shame, such a girl was suddenly brought into labour with all the pangs of an unattended, uncared for, and possibly difficult labour in the case of a first delivery, and they might well understand that it was very difficult to persuade a jury that the acts of a woman in those circumstances were acts for which she ought to be held criminally responsible. It had been difficult enough in the past under the existing law to get convictions for infanticide. But when the girl was charged with an act done in the very course of delivery he thought it would be still more difficult. He did not believe that a single child life would be spared by this new provision.

A Social Defect.

But that was not really the reason why he complained of the Bill. There was a very grievous social defect in

It applied not merely to the mother but to third persons who by a wilful act, intending to destroy the life of a child did in fact cause its death. That applied to doctors and midwives—to doctors in particular—and it raised the momentous question as to what was the position of a doctor when he had to consider during delivery whether or not it was necessary to save the life of the mother or the life of the child. It would be seen that the scheme of the Bill was that such a doctor committed a criminal offence unless he proved, the onus being upon him, that he acted in good faith and that it was necessary to take the action he took in order to save the life of the mother. That would be an intolerable burden to throw upon the profession. He was much opposed to the practice in legislation of creating crimes and throwing the onus upon anyone of proving that he was innocent; it was a course which had been adopted far too freely, but never in such a serious case as this, where the maximum penalty was penal servitude for life. Doctors had been harried quite enough by litigation, and to add this burden to the cares of an ordinary practitioner was perfectly horrible. It was quite impossible. The onus put upon a doctor was bad enough; and it would be all the greater if the medical man who might have to consider this momentous question had to bear in his mind the question whether or not he might be charged by a disappointed parent, or by a malicious or mischief-making attendant, with this particular offence, when he would have to justify to a jury the question whether or not it was in fact necessary to lose the life of a child. For these reasons he thought that the Bill went very much further than was necessary. In so far as the Bill dealt with the offence of killing a child, the provision as to 28 weeks after conception seemed to be quite unnecessary, because such an act as that would, as he was advised, and as he understood, always be covered by the law as to procuring abortion. It was impossible in practice to kill the unborn child while still in the body of a mother without in fact procuring, and intending to procure, a miscarriage. While the Bill remained in its present form, in the interests of professional men, who specially required protection by their Lordships' House, it was, in his opinion, objectionable, and ought not to be passed.

Lord DAWSON associated himself with the arguments of Lord Atkin. They were bound to admit on the authority of Lord Darling that there was a gap in the law, and for the purposes of symmetry he conceived that there was an argument for filling that gap, but if one passed from the law to human considerations he suggested that it was a gap which their Lordships should not be too anxious to fill. The majority of these cases of infanticide to which the Bill referred were cases of unmarried mothers who had suffered for months under the stress of anxiety, culminating very often in difficult labour, when they could not be held as wholly responsible as ordinary mortals for their action, and he thought it was a very good thing if in many of these cases the law turned a blind eye to an offence of that character. Indeed, if one read the proceedings of the Law Courts one could detect that the judge trying the case was almost seeking for an opportunity to evade the conviction of these poor girls for felony which would mark them for the rest of their lives. In many cases what they needed was not legal conviction, but rather the hand of understanding and fellowship which would help them along the road again.

The Question of Responsibility of the Mother.

As far as his experience went, it could not honestly be said that they were fully responsible for their action at the time. If he put himself in the position of a professional man who had knowledge of an act of this kind taking place, he had no hesitation in saying, if he satisfied himself that the act had been performed under the stress of impulse and anxiety, he would consider it no part of his duty to divulge the fact to the powers that be; in fact, he would regard it as a matter in many instances, if it were done impulsively, as to which it was his duty to extend the advantages of professional privilege. Passing to the effect of the Bill on the medical profession, Lord Dawson pointed out the hardship that was inflicted on doctors and midwives, who were called upon to do their duty under considerable difficulties. This Bill, he said, threw upon them the onus of proving that they were not committing a crime. Apart from its injustice it would go far to inhibit and discourage them from doing their work without let or hindrance, and, from the point of view of fairness and justice to the doctor and the interests of the community, he emphatically urged their Lordships to reject the Bill.

Earl RUSSELL said if this were a crime which could be stopped by this Bill, and if it were a conscious crime which penalties would deter, there would be a great deal more to be said for the Bill going forward, but if it did go forward he felt that it would be advantageous to refer it again to the Select Committee to consider carefully all the circumstances, and particularly safeguards. To throw upon doctors and midwives the onus of proving that they were innocent was a very serious and a most undesirable thing.

The Government's Attitude.

The LORD CHANCELLOR said that as this matter wa eminently one of legal and criminal procedure, the Hous would like to hear from himself what attitude the Gover ment took up in regard to it. When the original Bill can before their Lordships last summer he (Lord Hailsham) sa that he doubted whether the cases were quite as frequer as Mr. Justice Talbot (who called attention to the gap i the law in a charge to the Grand Jury) seemed to think but that there was at present a position under which a chi fully born could be killed with impunity either by its moth or by any third person, unless it could be proved that i had an independent circulation, did not seem to be a ver satisfactory state in which to leave the criminal law. Assur ing that there was a gap, then came the question as t whether this Bill satisfactorily closed it. It had bee pointed out that there were two classes of persons, broad speaking, in regard to whom this Bill might be called in operation. First of all there was the mother of the chil Some of their Lordships had said that when an unmarri mother in the pangs of childbirth killed her child she w very often largely irresponsible, and hardly conscious what she was doing. He did not think that any of the Lordships would dispute that proposition, but it appli not merely when she killed the child while it was in the a of being born, or before it had an independent circulatior it also applied when she killed the child almost immediate after its birth, which was the common case of infanticid and which had been recognised as a crime by the law. N doubt it was true that when a crime of that kind was cor mitted the circumstances under which it had been committ were matters properly to be taken into account, and und our modern system of criminal law were, he though invariably taken into account in considering what ste should be taken in regard to the unfortunate woman. I many cases the courts had taken the view that in such case it was not right that she should suffer any punishmen but that some probation system should be brought int play under which she could be taken care of and shepherd into wiser and better ways. That, of course, would equal be the case under this Bill should it become law. Th came the other classes of persons, the doctor and the midwi With regard to that he agreed that it was most importa that the position of such professional persons should safeguarded. When the original Bill came before the Lordships' House attention was called to the very poi which Lord Atkin and Lord Dawson had raised that afte noon, and it was partly on that account that the Bill w sent to a Select Committee which he noticed contain among its members Lord Dawson. Whether or not t exact phraseology of the Bill as it stood was sufficient safeguard that position was no doubt a matter which mig well be carefully considered, either by a Select Committe or by their Lordships' House in committee, whichever mig be more convenient. He (Lord Hailsham) was not sur that he quite agreed with Lord Atkin when he said th the burden was put upon the doctor of proving the necessi of taking life in order that he might escape from respons bility. What he had to prove was that he acted in go faith for the purpose of preserving the life of the mothe and although in fact he was mistaken in thinking that was necessary for that purpose to kill the child, as he re the Bill the doctor would not be under any liability so lo as he acted in the honest belief that the necessity existe But that was a matter of phraseology, and eminently committee point. It was obviously a point that should made clear if there was any doubt about it, and since Lo Atkin took that point there was obviously a doubt whic should be cleared away. He did not think, however, th that was a reason for rejecting the second reading altogeth and leaving the gap in the law unclosed. In those circun stances he suggested that it would be reasonable to allo the Bill to have a second reading, and then to consider either by reference to a Select Committee or in committe of their Lordships' House.

Lord ATKIN said he would be quite content, as he suppose Lord DAWSON would also be content, not to divide the Hou on the matter, being satisfied that the Bill should be co sidered in committee.

The Bill was read a second time.

HOUSE OF COMMONS.

WEDNESDAY, NOV. 21ST.

Women Medical Students.

Mr. RHYS DAVIES asked the President of the Board c Education the number of women medical students who ha entered for university training for each of the last five yea in England, Scotland, and Wales respectively.—Mr. A. N SAMUEL (Financial Secretary to the Treasury) replied: regret that the information in my possession does n

enable me to state the number of entries of women medical students. The returns made to the University Grants Committee show that the total numbers of full-time women medical students attending university institutions for the past five years have been as follows :—

—	1923–24.	1924–25.	1925–26.	1926–27.	1927–28.
England.. ..	1375	1197	1059	930	862
Wales	35	32	30	32	30
Scotland ..	610	431	313	274	254
Total ..	2020	1660	1402	1236	1146

Blind Persons Pensions.

Mr. ROBINSON asked the Secretary to the Treasury what amount had been disbursed in pensions under the Old Age Pensions Acts, 1908 to 1924, and the Blind Persons Act, since Jan. 4th, 1926, and the number of persons at present in receipt of pension under these Acts.—Mr. A. M. SAMUEL replied: The amount disbursed for pensions under the Old Age Pensions Acts, 1908–1924 (including pensions granted by virtue of the Act of 1925), and the Blind Persons Act, 1920, for the period Jan. 1st, 1926, to Sept. 30th, 1928, is approximately £86,600,000. The number of persons (including blind persons) receiving pensions under the Old Age Pensions Acts, 1908–1924, on the last Friday in September, 1928, was 1,320,106. This figure includes 330,568 pensions payable by virtue of the Widows', Orphans', and Old Age Contributory Pensions Act, 1925, to persons over the age of 70.

Covered Sanitary Refuse Carts.

Sir ROBERT THOMAS asked the Minister of Health what progress had recently been made in the adoption of covered sanitary refuse carts by local authorities; and whether his department had decided upon any particular design as being most generally suitable.—Sir KINGSLEY WOOD replied: A number of types of such vehicles are at present to be seen in the Public Health Exhibition in the Agricultural Hall and some of these are being extensively used by local authorities. The answer to the last part of the question is in the negative.

Gas Poisoning and Workman's Compensation.

Mr. STEPHEN MITCHELL asked the Home Secretary whether, seeing that gas poisoning was not included under the Workmen's Compensation Act, he would consider the question of having the Act amended so as to include gas poisoning as an industrial disease.—Sir W. JOYNSON-HICKS replied: I am not quite certain to what the hon. Member refers. There are various forms of poisoning by fumes of gas, which are already scheduled. If, however, the hon. Member is referring to poisoning from gases such as carbon monoxide, which takes effect very rapidly, the circumstances would, as far as I am aware, always be such as to constitute an injury by accident for which compensation can be claimed under the ordinary provisions of the Act.

Annual Increase in the Population.

Sir REGINALD NEVILLE asked the Home Secretary what was the estimated present annual increase of the population of England and Wales.—Mr. CHAMBERLAIN replied: According to the published official estimates, the average annual increase in population between the date of the 1921 census and mid-1927 is approximately 234,000 in England and Wales.

Post-vaccinal Encephalitis.

Mr. GROVES asked the Minister of Health whether the five cases of post-vaccinal encephalitis (four of which were fatal), referred to on page 115 of the Rolleston Committee's Report, were vaccinated with Government lymph.—Mr. CHAMBERLAIN replied: I am informed that four of the cases were vaccinated with Government lymph and one was not. The latter case, and three of the four former cases, were those in which death occurred.

THURSDAY, NOV. 22ND.

Children's Deaths from Small-pox and Chicken-pox.

Mr. CECIL WILSON asked the Minister of Health how many deaths of children under 15 had taken place in this country during the past ten years from small-pox and chicken-pox respectively.—Mr. CHAMBERLAIN replied: The numbers of deaths of children under 15 in England and Wales during the past ten years classified to small-pox and chicken-pox in the Registrar-General's Annual Reports and Statistical Reviews were 70 and 563 respectively.

Definition of Surgical Appliances.

Dr. VERNON DAVIES asked the Minister of Health, in view of his decision under the National Health Insurance Regulations that a spinal jacket required for the treatment of tuberculosis of the spine was regarded as a splint, but that a spinal jacket required for the treatment of lateral curvature of the spine, which was often due to tuberculosis, was not a splint and, therefore, could not be supplied to insured persons, he would state his reasons for arriving at such a decision.—Mr. CHAMBERLAIN replied: The reason why a different view was taken with respect to the appliances in the particular cases in question is that I have to look not to the name given to an appliance but to the precise object which it is intended to serve. I have invited the Insurance Acts Committee of the British Medical Association to discuss with my department the difficulties of defining splints for the purposes of medical benefit, and I am sending my hon. friend a copy of the letter conveying the invitation which will indicate to him what are the points at issue.

Home Office and Codeine.

Colonel VAUGHAN-MORGAN asked the Home Secretary whether the alkaloid codeine had been added to the schedule under the Dangerous Drugs Act; if not, whether it was proposed to do so; and, if so, when that would be done.—Sir VIVIAN HENDERSON (Under Secretary to the Home Office) replied: The answer to both parts of the question is in the negative. Codeine is not regarded by most authorities as a habit-forming drug, and is not included in the International Conventions of The Hague and Geneva.

MONDAY, NOV. 26TH.

Morphine and Opium Alkaloids from India.

Lieut.-Colonel VAUGHAN-MORGAN asked the Under Secretary of State for India whether morphine and other alkaloids of opium were manufactured at the Government's factory at Ghazipur; if so, since when such manufacture had been carried on; what amount of morphine had been manufactured in each year since 1920; and what was the amount of revenue derived from its sale.—Earl WINTERTON replied: Various alkaloids of opium have been manufactured at the Ghazipur factory from waste products and contraband opium for many years, but it was not until about 1924 that they began to find a market in substantial quantities outside India. They are exported to the United Kingdom only, where their disposal for strictly medical and scientific purposes is governed by the stringent provisions of the Dangerous Drugs Act. The figures asked for in the last two parts of the question are given in the following statement:—

Season Nov. 1–Oct. 31.	Catamine hyd.-chlor.		Morphine hyd.-chlor.		Morphine acetate (A) and tartrate (T)		Codeia (C) and narcoline (N)		Morphia crude (M) and codeia crude (C).		Revenue from sales.
	lb.	oz.	lb.	oz.	lb.	oz.	lb.	oz.	lb.	oz.	Rupees.
1920–21	3	6	—	—	—	—	C 16	15	—	—	16,266
1921–22	0	10	34	6	—	—	—	—	—	—	9,123
1922–23	1	3	130	6	—	—	—	—	—	—	30,205
1923–24	2	2	424	15	—	—	C 31	2	M 4050 C 100	4 0	156,993
1924–25	—	—	140	6	A 14 T	12	C 2 N 19	2 15	M 2000	0	145,211
1925–26	—	—	146	14	T 11	10	—	—	M 6099	0	224,887
1926–27 (Nov. 1–Sept. 30)	—	—	129	2	A 4 T 8	4 11	C 0	5	M 281	0	157,382

The Schick Test in London Area.

Mr. DAY asked the Minister of Health whether there were any methods of coöperation now in force between his Department and the various educational and administrative departments in the metropolitan area for the introduction of immunisation by means of the Schick test for the purpose of reducing the attack rate of diphtheria.—Mr. CHAMBERLAIN replied: Yes, Sir. Many of the metropolitan borough councils have undertaken, with the sanction of my Department, immunisation work of the kind indicated in the question. I understand that the London County Council do not directly participate in this work, but in their capacity as local education authority they assist, when requested, by the dissemination of information on this subject through the schools.

Coroners' Inquiries in India.

Mr. MARDY JONES asked the Under Secretary of State for India whether the system of inquiry by a coroner and jury into deaths due to other than natural causes which occurred in British India was in force throughout British India; and, if not, in which provinces, if any, the said

system of judicial inquiry was in force at the present time.—Earl WINTERTON replied: The system is in force only in the Presidency towns of Calcutta and Bombay.

New Admissions to Mental Hospitals.

Mr. CECIL WILSON asked the Minister of Health to state for each quarter during the last five years the number of new admissions to mental hospitals.—Mr. CHAMBERLAIN replied: New admissions to mental hospitals in England and Wales during the last five years have been as follow:—

Year.	To county and borough mental hospitals.	To all other institutions for the insane and to private single care.	Total.
1923	21,375	1,679	23,054
1924	19,704	1,599	21,303
1925	20,327	1,457	21,784
1926	20,466	1,458	21,924
1927	20,474	1,419	21,893

Figures are not available for each quarter.

The Radium Monopoly of Belgium.

Commander BELLAIRS asked the Under Secretary of State for Foreign Affairs, in view of the importance of radium to the health of nations, whether the Government would raise the question of the radium monopoly of Belgium at the League of Nations and protest against the great rise in price in spite of increased production.—Sir KINGSLEY WOOD (Parliamentary Secretary to the Ministry of Health) replied: The whole question of the radium requirements of this country in relation to present sources of supply is at present under consideration by a subcommittee of the Committee of Civil Research.

TUESDAY, NOV. 27TH.

Scottish Parish Councils and Local Government Bill.

Mr. THOMAS HENDERSON asked the Secretary of State for Scotland how many parish councils in Scotland had written to him protesting against the proposals contained in the Government's Local Government (Scotland) Bill, and how many in favour.—Sir JOHN GILMOUR replied: Twenty parish councils have written opposing the proposals generally, and 79 have written opposing the transfer of the powers of parish councils to county councils. Three parish councils have written in favour of the proposals.

Tests for Motor Drivers.

Mr. LOUIS SMITH asked the Minister of Transport whether, having regard to the ever-increasing number of motor accidents caused by inexperienced drivers, he would make it compulsory for a would-be driver of either a motor-car or motor-cycle to pass a suitable and thorough test before receiving a driving licence.—Colonel W. ASHLEY replied: I have no power to make applicants for driving licences submit to a driving test, and so far as I am aware there is no evidence to show that any substantial proportion of motor accidents are due to any want of capacity on the part of drivers such as would be disclosed by a test of this kind.

Medical Examination of Air Force Recruits.

Mr. LUNN asked the Secretary of State for Air how many men and boys offered themselves as recruits for the Royal Air Force during 1927; how many were accepted; and how many were rejected on medical grounds.—Sir S. HOARE replied: 8356 men presented themselves for recruitment, and 2171 boys sat for the education test during 1927. Of these 2453 men and 1030 boys were finally accepted, and 4042 men and 192 boys were rejected on medical grounds.

Births, Marriages, and Deaths.

BIRTHS.

DREW.—On Nov. 23rd, at Greypoint, Worthing, to Mary, the wife of Dr. J. Grahame Drew—a daughter.

HUME.—On Nov. 23rd, at Southway, N.W. the wife of J. Basil Hume, M.S., F.R.C.S., of a daughter.

STUTTAFORD.—On Nov. 21st, at Horning, near Wroxham, Norwich, the wife of W. J. E. Stuttaford, M.C., M.R.C.S., L.R.C.P., of a son.

MARRIAGES.

BISHOP—WILLIS.—On Nov. 22nd, at St. Mary's Church, Bromley, Kent, George Spencer Armitage Bishop, M.B., F.R.C.S.E., of Melton Mowbray, to Phyllis Marianne, youngest daughter of the late Mr. Walter Willis and Mrs. Willis, of Bromley, Kent.

CRAWFORD—GOETZE.—On Nov. 21st, at St. Martin-in-the-Fields, Edward Sydney Atkinson Crawford, B.A., M.B., B.Ch., B.A.O., T.C.D., to Marie Louise Pauline Goetze, M.R.C.S., L.R.C.P. Lond., M.B., B.S. Lond.

DEATHS.

GOOD.—On Nov. 24th, at "Wayside," Pinhoe, Devon, Charles Walter Good, late of THE LANCET, aged 67.

HILL.—On Nov. 24th, suddenly, Dr. William Hill, M.D., B.Sc., of Weymouth-street, Portland-place.

JONES.—On Nov. 23rd, at Morley-road, Lewisham, Thomas Burnell Jones, M.R.C.S. Eng., L.R.C.P. Lond., aged 69.

RUSSELL.—On Nov. 22nd, at Langley-drive, Wanstead, John Hutchinson Russell, M.R.C.S., L.S.A. (late of Forest Gate), aged 69.

SMITH.—On Nov. 21st, at Balgonie House, Ryton-on-Tyne, James Wilkie Smith, M.D., C.M., D.Hy., aged 76.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Medical News.

UNIVERSITY OF OXFORD.—At a congregation held on Nov. 24th the degree of Doctor of Medicine was conferred on R. J. Brocklehurst, H. F. Turney, and D. G. T. Kerr Cross (in absentia).

Dr. Malcolm H. MacKeith has been appointed Dean of the Medical School.

UNIVERSITY OF CAMBRIDGE.—At a congregation held on Nov. 24th the following degrees were conferred:—

M.D.—A. D. Whitelaw.

M.B. & B.Chir.—N. R. Barrett, H. S. Waters, P. R. Buckton.

UNIVERSITY OF LONDON.—At a meeting of the Senate held on Nov. 21st the degree of D.Sc. was conferred on Prof. F. G. Parsons (anthropology), University Professor of Anatomy, Mr. William Robson (biochemistry), Mrs. Norah Edkins (physiology), and Mr. J. W. Cox (psychology).

A course of five lectures on the Rôle of Bacteria in Nature will be given by Dr. F. W. Twort at 4 P.M. on Dec. 3rd, 5th, 7th, 10th, and 12th, in the theatre of the Royal College of Surgeons, Lincoln's Inn-fields, London, W.C. Admission is free without ticket.

SOCIETY OF APOTHECARIES OF LONDON.—At a recent examination the following candidates were successful in the undermentioned subjects:—

Surgery.—J. Freud, Vienna and St. Bartholomew's Hospital; W. S. Ghai, Charing Cross Hospital; W. D. Glynn-Jones, Guy's Hospital; H. C. Johnson, Minnesota, U.S.A.; T. K. S. Lyle, King's College Hospital; A. Weeks, St. Bartholomew's Hospital.

Medicine.—J. Freud, Vienna and St. Bartholomew's Hospital; W. D. Glynn-Jones, Guy's Hospital; E. C. Gross, Guy's Hospital; M. H. Rashwan, Guy's Hospital; L. Wasef, Manchester.

Forensic Medicine.—W. D. Glynn-Jones, Guy's Hospital; D. F. Michael, St. Mary's Hospital.

Midwifery.—N. Datta, London Hospital; J. D. B. Games, St. Bartholomew's Hospital; E. C. Gross, Guy's Hospital; A. Liberis, St. Bartholomew's Hospital; T. K. S. Lyle, King's College Hospital; A. Weeks, St. Bartholomew's Hospital.

The Diploma of the Society was granted to the following candidates, entitling them to practise medicine, surgery, and midwifery: E. C. Gross, H. C. Johnson, T. K. S. Lyle, M. H. Rashwan, and L. Wasef.

Mr. H. W. Carson has left for America where he is delivering the Mutter lecture before the College of Physicians of Philadelphia.

A HOSPITAL JEWEL CASKET.—A committee of ladies is collecting jewellery to form a casket to be presented to the Queen when she opens the extensions of the Elizabeth Garrett Anderson Hospital next spring. It is hoped to endow a bed by the sale of the jewels.

Messrs. Edward Arnold and Co. announce the early appearance of a second edition of "Diseases of Children," the first edition of which was edited by Sir Archibald Garrod, Dr. Hugh Thursfield, and the late Dr. F. E. Batten. The new volume will be edited by Dr. Thursfield in collaboration with Dr. Donald Patterson.

PAY-BEDS AT SUNDERLAND.—As the result of enlargements two wards in Sunderland Royal Infirmary are being altered and modernised for the reception of 22 paying patients. For an experimental period of a year the board of management have fixed the fees for maintenance and nursing at three guineas weekly in the open wards and five guineas in the two-bed wards.

Obituary.

SIR HECTOR CLARE CAMERON, C.B.E., M.D., F.R.F.P.S. GLASG., LL.D.

THE death of Sir Hector Cameron on Nov. 22nd closes a long and useful career as surgeon, teacher, and administrator. Appointed to full charge of the surgical wards of the Royal Infirmary at Glasgow as long ago as 1875, he was professor of clinical surgery in the University during the first ten years of this century, and continued to do strenuous work for hospitals and medical education until comparatively lately.

The son of Duncan Cameron, sugar planter of Demarara, Hector Cameron was born in British Guiana 85 years ago, and was sent as a boy to Scotland where for some time he lived in the household of Norman Macleod, the younger, then parish minister of Dalkeith. Thence he went to the Madras College at St. Andrews and to Edinburgh University where he began the study of medicine. Most of his medical instruction, however, was gained at Glasgow, and in his year of graduation, 1866, he was appointed house surgeon to Joseph Lister at the Royal Infirmary. This appointment naturally had a great influence on Cameron's opinions and ambitions, and it was also the beginning of a friendship between the surgical pioneer and his young assistant. When Lister left Glasgow in 1869 Cameron found himself one of the chief exponents of antiseptic surgery in Glasgow, and as the new creed was beginning to get approval—though by no means always understanding—the path of hospital promotion and consulting practice lay wide open before him. So capable a man was not slow to grasp his opportunity. He became a Fellow of the Faculty of Physicians and Surgeons in 1870 and received appointments at the Glasgow Eye Infirmary and Lock Hospital. Then at the early age of 32 he was given full charge of the Royal Infirmary's surgical wards, an appointment which he held with distinction during the next six years. When he resigned in 1881 it was to go as surgeon to the Western Infirmary, at the same time joining the staff of the newly established Royal Hospital for Sick Children. To these institutions he brought a true appreciation of what Lister's system meant, and he taught it as practised by Lister himself. His services were thus of immense advantage to the Glasgow medical school. "Before his appointment," writes Sir George Beatson, "antiseptic surgery at the Western Infirmary was carried on in a very haphazard and lax manner, the surgeons being formerly on the staff of the Royal Infirmary, in Lister's day, when, as we all know, the surgeons regarded Lister's views and work with scepticism and sided with the managers, who were ever actively hostile to it and opposed it. But Cameron soon made his influence felt. As a teacher it was well known that he won the confidence and good opinion of his students, being a clear and lucid lecturer. In his operative work he followed his teacher Lister in not aiming at brilliancy, but brought to his work a careful judgment and attention to detail that made him a very successful surgeon. Consequently he soon won an outside reputation and had a very large practice."

SIR HECTOR CAMERON.

Photograph by Annan, Glasgow.

As Lister's disciple and missionary Cameron was in a position to spread his teaching far and wide through graduates of the Glasgow medical school, and in the process he won for himself the reputation, as a colleague puts it, of being "to many generations a beloved master, and to the people of the West of Scotland a tower of strength and confidence." President successively of the Glasgow Medico-Chirurgical Society, the Pathological and Clinical Society, and, in 1897, of the Faculty of Physicians and Surgeons, he also became a power in the University. When George Buchanan resigned the chair of clinical surgery in 1900 the Court appointed Cameron to succeed him without even advertising for other candidates. Thus he reached professorial rank at the comparatively late age of 57.

The fact that teaching and private practice always made great demands on his time probably explains why his contributions to surgical literature were fewer than might have been wished, considering his comprehensive experience and powers of lucid and accurate expression. As long ago as 1876, however, he contributed Illustrations of Antiseptic Surgery to our columns, and in later years he several times had occasion to write illuminating reviews of the progress of operative technique, besides recording a certain number of clinical observations. In 1907 appeared his "Evolution of Wound Treatment in the Last Forty Years," which may be regarded as a surgical confession of faith. He was one of a small committee which in 1909 was responsible for the issue of the "Collected Papers of Lord Lister," the other members being Watson Cheyne, Rickman Godlee, C. J. Martin, and Dawson Williams, and only last year, in connexion with the centenary of his old chief, he gave accounts of his personal reminiscences to appreciative audiences. Cameron's memory was indeed always one of his greatest assets. "His exceptional and almost extraordinary power of remembering what appealed to his imagination," writes Mr. A. E. Maylard, "stored his brain with an amount of knowledge that found a ready outlet in his work, so that he never lacked that which enabled him in operating to surmount the difficulties he might encounter. . . . None in later life can have failed, however short the acquaintance, to have come under the spell, indeed gift, of telling a good story. Here, also, his exceptional power of memorising anything he may have heard or read in prose or poetry seems to have served him well." His great capacity for attracting strangers and keeping friends was used to the full. He was universally esteemed and liked, and he stood very high in the opinion of his medical brethren and of the community at large, which admired and trusted him.

Retiring in 1910 at the age of 67 from his University chair, it might have been thought that he would enjoy a leisured existence. With the war, however, there came new chances of service, and he became Red Cross Commissioner for Western Scotland with supervision of nearly 3000 beds. In this work his sagacity and outstanding tact were highly valued by his colleagues, and good use was again made of these qualities when in 1921 he was appointed by the General Medical Council to supervise examinations conducted by medical schools throughout Great Britain and Ireland. Representative of the Royal Faculty of Physicians and Surgeons on the Council from 1888 to 1903, he was already fully familiar with its educational work, and despite his 78 years was

system of judicial inquiry was in force at the present time.—Earl WINTERTON replied: The system is in force only in the Presidency towns of Calcutta and Bombay.

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1925	20,327	1,457	21,784
1926	20,466	1,458	21,924
1927	20,474	1,419	21,893

Figures are not available for each quarter.

The Radium Monopoly of Belgium.

Commander BELLAIRS asked the Under Secretary of State for Foreign Affairs, in view of the importance of radium to the health of nations, whether the Government would raise the question of the radium monopoly of Belgium at the League of Nations and protest against the great rise in price in spite of increased production.—Sir KINGSLEY WOOD (Parliamentary Secretary to the Ministry of Health) replied: The whole question of the radium requirements of this country in relation to present sources of supply is at present under consideration by a subcommittee of the Committee of Civil Research.

TUESDAY, NOV. 27TH.

Scottish Parish Councils and Local Government Bill.

Mr. THOMAS HENDERSON asked the Secretary of State for Scotland how many parish councils in Scotland had written to him protesting against the proposals contained in the Government's Local Government (Scotland) Bill, and how many in favour.—Sir JOHN GILMOUR replied: Twenty parish councils have written opposing the proposals generally, and 79 have written opposing the transfer of the powers of parish councils to county councils. Three parish councils have written in favour of the proposals.

Tests for Motor Drivers.

Mr. LOUIS SMITH asked the Minister of Transport whether, having regard to the ever-increasing number of motor accidents caused by inexperienced drivers, he would make it compulsory for a would-be driver of either a motor-car or motor-cycle to pass a suitable and thorough test before receiving a driving licence.—Colonel W. ASHLEY replied: I have no power to make applicants for driving licences submit to a driving test, and so far as I am aware there is no evidence to show that any substantial proportion of motor accidents are due to any want of capacity on the part of drivers such as would be disclosed by a test of this kind.

Medical Examination of Air Force Recruits.

Mr. LUNN asked the Secretary of State for Air how many men and boys offered themselves as recruits for the Royal Air Force during 1927; how many were accepted; and how many were rejected on medical grounds.—Sir S. HOARE replied: 8356 men presented themselves for recruitment, and 2171 boys sat for the education test during 1927. Of these 2453 men and 1030 boys were finally accepted, and 4042 men and 192 boys were rejected on medical grounds.

Births, Marriages, and Deaths.

BIRTHS.

DREW.—On Nov. 23rd, at Greypoint, Worthing, to Mary, the wife of Dr. J. Grahame Drew—a daughter.

HUME.—On Nov. 23rd, at Southway, N.W. the wife of J. Basil Hume, M.S., F.R.C.S., of a daughter.

STUTTAFORD.—On Nov. 21st, at Horning, near Wroxham, Norwich, the wife of W. J. E. Stuttaford, M.C., M.R.C.S., L.R.C.P., of a son.

MARRIAGES.

BISHOP—WILLIS.—On Nov. 22nd, at St. Mary's Church, Bromley, Kent, George Spencer Armitage Bishop, M.B., F.R.C.S.E., of Melton Mowbray, to Phyllis Marianne, youngest daughter of the late Mr. Walter Willis and Mrs. Willis, of Bromley, Kent.

CRAWFORD—GOETZE.—On Nov. 21st, at St. Martin-in-the-Fields, Edward Sydney Atkinson Crawford, B.A., M.B., B.Ch., B.A.O., T.C.D., to Marie Louise Pauline Goetze, M.R.C.S., L.R.C.P. Lond., M.B., B.S. Lond.

DEATHS.

GOOD.—On Nov. 24th, at "Wayside," Pinhoe, Devon, Charles Walter Good, late of THE LANCET, aged 67.

HILL.—On Nov. 24th, suddenly, Dr. William Hill, M.D., B.Sc., of Weymouth-street, Portland-place.

JONES.—On Nov. 23rd, at Morley-road, Lewisham, Thomas Burnell Jones, M.R.C.S. Eng., L.R.C.P. Lond., aged 69.

RUSSELL.—On Nov. 22nd, at Langley-drive, Wanstead, John Hutchinson Russell, M.R.C.S., L.S.A. (late of Forest Gate), aged 69.

SMITH.—On Nov. 21st, at Balgonie House, Ryton-on-Tyne, James Wilkie Smith, M.D., C.M., D.Hy., aged 76.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Medical News.

UNIVERSITY OF OXFORD.—At a congregation held on Nov. 24th the degree of Doctor of Medicine was conferred on R. J. Brocklehurst, H. F. Turney, and D. G. T. Kerr Cross (in absentia).

Dr. Malcolm H. MacKeith has been appointed Dean of the Medical School.

UNIVERSITY OF CAMBRIDGE.—At a congregation held on Nov. 24th the following degrees were conferred:—

M.D.—A. D. Whitelaw.

M.B. & B.Chir.—N. R. Barrett, H. S. Waters, P. R. Buckton.

UNIVERSITY OF LONDON.—At a meeting of the Senate held on Nov. 21st the degree of D.Sc. was conferred on Prof. F. G. Parsons (anthropology), University Professor of Anatomy, Mr. William Robson (biochemistry), Mrs. Norah Edkins (physiology), and Mr. J. W. Cox (psychology).

A course of five lectures on the Rôle of Bacteria in Nature will be given by Dr. F. W. Twort at 4 P.M. on Dec. 3rd, 5th, 7th, 10th, and 12th, in the theatre of the Royal College of Surgeons, Lincoln's Inn-fields, London, W.C. Admission is free without ticket.

SOCIETY OF APOTHECARIES OF LONDON.—At recent examination the following candidates were succe in the undermentioned subjects:—

Surgery.—J. Freud, Vienna and St. Bartholomew's Ho W. S. Ghai, Charing Cross Hospital; W. D. Glynn Guy's Hospital; H. C. Johnson, Minnesota, T. K. S. Lyle, King's College Hospital; A. W Bartholomew's Hospital.

Medicine.—J. Freud, Vienna and St. Bartholomew' W. D. Glynn-Jones, Guy's Hospital; E. C. Hospital; M. H. Rashwan, Guy's Hospital Manchester.

Forensic Medicine.—W. D. Glynn-Jones, G D. F. Michael, St. Mary's Hospital.

Midwifery.—N. Datta, London Hospital; St. Bartholomew's Hospital; E. C. Gro A. Liberis, St. Bartholomew's Hospit King's College Hospital; A. Weeks Hospital.

The Diploma of the Society was gr candidates, entitling them to practise midwifery: E. C. Gross, H. C. J M. H. Rashwan, and L. Wasef.

Mr. H. W. Carson has left delivering the Mutter lecture b of Philadelphia.

A HOSPITAL JEWEL ladies is collecting jewelle to the Queen when she o Garrett Anderson Hospi a bed by the sale of th

Messrs. Edward early appearance of Children," the first ed Archibald Garrod, Dr. F. E. Batten. The n Thursfield in collaborati

PAY-BEDS AT SUN enlargements two wards in being altered and modernis patients. For an experimen of management have fixed t nursing at three guineas wee five guineas in the two-bed wa

He was a popular teacher, and his readiness to share in all work of healing and amelioration of symptoms won him the confidence of general practitioners, who alone know the amount of unostentatious work that Dr. Hill performed without any thought of remuneration.

Dr. Hill was a great reader, but was also keen on outdoor pursuits. In his leisure times he was never more happy than when engaged in yachting and sea-fishing either in the West of England or at Ramsgate, where he was a popular member of the Royal Temple Yacht Club. He was happily active to the end, having seen his last patient only 20 minutes before his death. He will be greatly missed, not only by those who knew him intimately but by all to whom his genial presence was familiar.

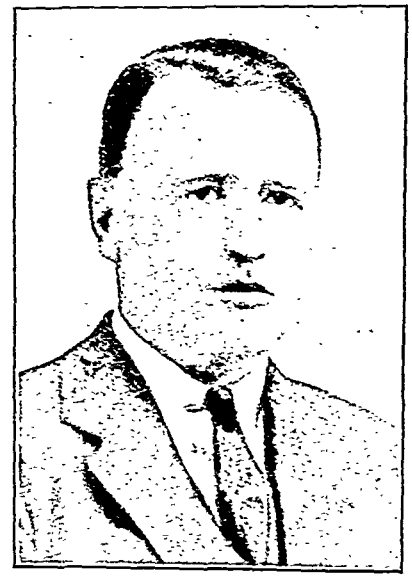
An old friend writes:—"Forty-one years ago I first met William Hill when he appeared in the library of Epsom College to preside over the matriculation examination of the London University. Three years later I encountered him in the dissecting room of St. Mary's Hospital Medical School, where he occupied the position of senior of a handsome trio of demonstrators—Hill, Roughton, and Cagney. Hill's control of the department was perfect. Anatomy, however, did not long retain him; before long he had become aural surgeon to St. Mary's Hospital, and for years has been recognised as one of the foremost specialists in that branch of surgery. His tragic and unexpected death will be mourned by a host of good friends. The secret of his popularity was in his qualities of unfailing good temper, urbanity, a natural kindliness of disposition, and a keen sense of humour. His hospitality was enjoyed by many, and he was a charming host. He was greatly in request as an after-dinner speaker, for he had a pungent humour coupled with a naive address which never failed to amuse. His excellent memory made it easy for him to exploit the foibles and fancies of his listeners, but his wit was never unkind, and his great delight was to get back as good as he gave. One of the qualities that so greatly endeared him to his friends was his constant endeavour to help those younger than himself. His hand was ever at the service of those who exhibited a keen desire to learn. His prominence as a Freemason was a tribute to his sterling qualities. He was one of the founders of the Sancta Maria Lodge, became master in 1910, and in that capacity was a great success. He had a large share in the prosperity of the William Harvey Royal Arch Chapter, and his services were recognised some years ago by promotion to the rank of Past Grand Deacon of England. To the end he was one of the strongest supporters of the Sancta Maria Lodge, and many of those present a fortnight ago will long remember that their last meeting with him was under such happy auspices."

William Hill married Flora Hastings, daughter of David Robert Comyn, to whom our sincere sympathy is extended. A memorial service held at St. Mary's Hospital on Nov. 28th was large attended by friends, colleagues, and former pupils.

SYDNEY JAMES CLEGG, O.B.E., M.D. MANCH., D.P.H.

WE regret to announce the death on Nov. 23rd of Dr. Sydney Clegg, whereby a useful life spent in the public health service has been cut short at the early age of 40. Dr. Clegg's home was at Swinton, near Manchester, and he studied medicine at the Victoria University, qualifying in 1909. He was possessed of a splendid physique and distinguished himself at this time in many branches of sport, being captain of the University first eleven for both football and cricket. After holding an appointment at the Crumpsall Infirmary, and a term in private practice, he joined the staff of the Newcastle-upon-Tyne Health Department, rising gradually from a resident medical officer at the Infectious Diseases Hospital to the position of deputy medical officer of health.

During the late war he was amongst the earliest volunteers for overseas service, joining a fighting battalion as medical officer; from this he was taken to organise and command one of the first sanitary sections. His wide knowledge and experience of sanitation brought him rapid promotion, until by the end of the war he was D.A.D.M.S., 3rd Army Corps. He was awarded the O.B.E. (Military) and the Médaille d'honneur des epidémies (en argent). He was the means of introducing, among other things, methods of dealing with refuse and for the control of milk, which were adopted over the whole of the Western Front. At the end of the war he returned to Newcastle, where, writes Prof. H. Kerr, he was extraordinarily popular with all sections of the community, and was held in the highest esteem by members of the City Council. In 1923 he obtained the appointment of medical officer of health for Durban, Natal, for which post he received a unique testimonial signed by no less than eight ex-lord-mayors of Newcastle-upon-Tyne, while he was accorded a special farewell banquet by members of the City Council and other friends. He remained for five years in Durban where he strove hard for the improvement of the local preventive machinery—and with considerable success, as was attested on all sides. The position was, however, uncongenial to one of his temperament, and his feeling of ineffectiveness, together with the rigours of the climate, exacted heavy toll from his health. He returned to England last September and took up residence at Rhos-on-Sea; here he was struck down by lobar pneumonia, which ended fatally in a few days, his powers of resistance not yet having recovered their normal tone.



DR. S. J. CLEGG.

"Clegg's passing," Prof. Kerr continues, "removes a striking figure from preventive medicine. His wide sympathies and broad outlook endeared him to all with whom he came in contact and created for him a very large number of friends." Great sympathy will be felt with his widow.

HERTFORD COUNTY HOSPITAL.—This institution is to be enlarged at a cost of £35,000. The number of beds will then be 131, and the domestic accommodation will be much improved. The kitchens are officially described as "right down in the basement and pitch dark." This hospital has nine times been enlarged or rebuilt since its establishment in 1833.

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH.—The office-bearers of this Society for 1928–29 will be:—President: Dr. A. Logan Turner. Vice-Presidents: Dr. R. A. Fleming, Dr. C. E. Douglas, and Mr. J. W. Dowden. Councillors: Prof. William Russell, Dr. Frederick Porter, Dr. David Huskie, Mr. J. J. M. Shaw, Dr. Charles M'Neil, Dr. Andrew Ritchie, Dr. Murray Wood, and Mr. J. W. Struthers. Treasurer: Dr. Macrae Taylor. Secretaries: Dr. Alexander Goodall and Mr. A. Pirie Watson. Editor of Transactions: Dr. Fergus Hewat.

able to travel all over the country in the course of his duties.

In 1924 Cameron was called upon to unveil the statue of Lord Lister in Kelvingrove Park, and two years later himself received a testimonial to the affection and friendship of his old pupils and fellow citizens. Two portraits of him were painted by public subscription, one of them being presented to the University of Glasgow and the other to himself. This was the last of a long series of honours, including a knighthood conferred in 1900, the C.B.E. in recognition of his war services, and the honorary degree of Doctor of Laws granted in 1910 and 1911 by the Universities of St. Andrews and Glasgow.

Mr. Henry Rutherfurd says of his old teacher and colleague: "It is over 40 years since I first met him in 1882, when I was a student in his clinic at the Western Infirmary, Glasgow. I remember well how I was impressed by his quiet, courteous manner, in relation both to patients and students. On the rare occasions when examination post mortem showed him to have been wrong in opinion or procedure, he told the class frankly and explained as far as might be the cause of error . . . His interests were not confined to professional matters. He was widely read and remembered what he had read, and this was only one instance of his excellent memory; it concerned men and things heard or seen. He was as observant on the hillside, the links, or beside the river as he was among his patients. He loved tracking the birds and identifying the various callers. He was a good shot; a friend and colleague once said of him, with something of a complaint, that he was 'as siccar with his gun as he was with his knife.' He leaves a happy memory, gracious and inspiring."

Sir Hector Cameron married in 1872 Frances, daughter of William Hamilton Macdonald. She died seven years later, leaving him with four children, three of whom survive. Of his sons the elder is Colonel Donald Cameron, R.A.S.C., and the younger is Dr. Hector Charles Cameron, physician to Guy's Hospital.

GEORGE WILLIAM HILL, M.D. LOND., F.R.F.P.S. GLASG.

THE death of Dr. William Hill, consulting surgeon for diseases of the ear, nose, and throat to St. Mary's Hospital, occurred with startling suddenness on Saturday, Nov. 24th, while he was still actively engaged in the pursuit of his profession.

Born in 1858, William Hill was the son of George Hill, of Tregassick, Cornwall, and had even as a boy the sociable and attractive personality which was to become so well known in professional circles. He was educated at King's College, London, and studied for a brief period at St. George's Hospital before entering St. Mary's with the Senior Entrance Science Scholarship in 1879. He had a brilliant career as a student, taking prizes in physiology, medicine, and surgery, and the scholarship in pathology. He was made demonstrator of histology and biology even before qualification, and during this period, in 1881, took the B.Sc. London with honours. He then became junior demonstrator of anatomy and assistant pathologist, qualifying L.S.A. in 1884, and gaining honours in the Final M.B. London in 1885. For two years after qualifying Dr. Hill practised medicine in Cornwall, but in 1886 he returned to London and took up throat and ear work, becoming registrar and pathologist at the Central London Throat and Ear Hospital. At the same time he renewed his active connexion with the Anatomical Department at St. Mary's, holding the post of demonstrator and assistant lecturer in anatomy at the Medical School from 1887 to 1894. His versatility at this period of his career was remarkable, since besides working as clinical assistant in the aural department of the hospital, he acted also as lecturer in botany at University College from 1886 to 1890, in which year he found time to take his M.D. In 1894 he was appointed aural surgeon to St. Mary's, and when, in 1908, the ear and throat departments were amalgamated they were placed under Dr. Hill's charge. He remained surgeon to the newly formed ear, nose, and throat department at St. Mary's for 11 years, and on his retirement in 1919 was elected consulting surgeon.

DR. WILLIAM HILL.

Dr. Hill was especially interested in the study of endoscopic methods for the examination of the air and food passages, and at the time of his death still held the post of endoscopic surgeon (for diseases of the gullet) at the Metropolitan Ear and Nose Hospital. The practical instruments he has devised in this connexion, as the outcome of his researches, will ensure his lasting fame. Soon after the introduction of the direct method of examining the upper air and food passages, he became a pioneer in the application of the method to the œsophagus, and of the introduction by this means of radium into malignant tumours of this region. He showed great ingenuity in designing and adapting instruments for the treatment of these cases, and devised the "Hill's tube" for the intubation of malignant œsophageal strictures. In the course of his investigations on œsophageal disease the possibility of developing direct gastroscopic examination occurred to him. Such examinations had been attempted by various observers without much success, but the publication in 1912 of Hill's book on Gastroscopy and the Œsophago-Gastroscope, renewed interest in the subject. The gastroscope associated with Hill's name can be passed into the stomach with safety, and gives an excellent view of the interior of the organ.

Dr. William Hill was a prominent member of medical societies. He presided over the Oto-rhino-laryngological section of the B.M.A. in 1921, and over the Harveian Society. He was a vice-president of the old Laryngological Society of London, and in 1914 President of the Laryngological Section of the Royal Society of Medicine, being until his death an active member of the latter body, and a regular attendant at its meetings. He was a member of the committee of the London and Counties Medical Protection Society. As recently as July of this year he read a paper on the treatment of certain forms of deafness by radium, at the annual meeting of the B.M.A. at Cardiff.

In his own home William Hill exhibited the same geniality as in his public life, and was always ready to offer to relatives or friends, whether in sickness or in health, entertainment or professional advice, according to the need of the moment. His charm of manner attached him to all who came in contact with him socially and professionally.

peak year of 1924 there has been a progressive decline in the reported incidence of this disease. Among the attempts to deal with the administrative problems of post-encephalitis lethargica, the "encephalitis unit" at Winchmore Hill continues to fulfil a very useful function in the case of juvenile patients mainly from the metropolitan area, and owing to the diminishing demands of London cases, extra-metropolitan applications for admission have been considered and a certain number met.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY, Albemarle-street, W.

THURSDAY, Dec. 6th.—4.30 P.M.—*The following papers will be read:* A. E. Boycott, F.R.S., C. Diver, S. Hardy, and F. M. Turner: The Inheritance of Sinistrality in Limnæa Peregra. R. H. Burne, F.R.S.: A System of "Fine" Vessels associated with the Lymphatics in the Cod (*Gadus Morrhua*). E. Hindle: Further Observations on Chinese Kala-azar. *The following papers will be read in title only:* Eric Ponder: Hæmolysis by Brilliant Green and Serum. (Communicated by Sir E. Sharpey Schafer, F.R.S.) A. V. Hill, F.R.S., Grace Eggleton, and P. Eggleton: The Coefficient of the Diffusion of Lactic Acid through Muscle. C. H. Best, K. Furusawa, and J. H. Ridout: The Respiratory Quotient of the Excess Metabolism of Exercise. (Communicated by A. V. Hill, F.R.S.) A. V. Hill, F.R.S., and W. Hartree: The Energy Liberated by an Isolated Muscle during the Performance of Work. A. V. Hill, F.R.S.: The Diffusion of Oxygen and Lactic Acid through Tissues. (Parts I., II., III., and IV.) D. Keilin, F.R.S.: Cytochrome and Respiratory Enzymes. F. R. Miller and N. B. Laughton: Myograms yielded by Faradic Stimulation of the Cerebellar Nuclei. (Communicated by A. B. Macallum, F.R.S.) D. Burk: The Free Energy of Glycogen-Lactic Acid Breakdown in Muscle. (Communicated by A. V. Hill, F.R.S.) F. C. Smith: The Ultra-violet Absorption Spectra of certain Aromatic Amino-acids and of the Serum Proteins. (Communicated by C. Lovatt Evans, F.R.S.)

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Dec. 4th.—8.30 P.M., ORTHOPÆDICS. A discussion on the Stiff and Painful Shoulder. Opener: Mr. George Perkins. Other speakers: Mr. McCrae Aitken, Mr. Alan Todd, Dr. Alexander Mercer, Mr. J. R. Lee, Mr. B. Whitchurch Howell, Dr. Brailsford, and othe[illegible] meeting at St. [illegible]ations: M. H. C[illegible]dies to Vaccine [illegible] L. P. Garrod: [illegible]s. T. H. G. Shore: [illegible] W. Shaw: Krukenl[illegible] B. Hume: Unusual [illegible] T. Jockes and F. H. K[illegible] in Rats. Surgical Unit: [illegible] G. Canti: Cinematogra[illegible]ler Dark Ground Illumination.

WEDNESDAY.—4.30 P.M., SURGERY (at Guy's Hospital). Operations. Demonstration of cases.

THURSDAY.—8.15 P.M., TROPICAL DISEASES. Paper: Dr. H. Harold Scott and Dr. H. B. Day: Clinical and Pathological Correlation in Typhoid and Allied Diseases.

FRIDAY.—10.30 A.M., OTOLOGY. (Cases at 9.30 A.M.). Discussion on Meningitis. Papers will be read by: Mr. G. J. Jenkins, Mr. T. B. Layton: An Otitic Meningism; and Mr. E. D. D. Davis: The Morbid Anatomy, Prevention, and Early Diagnosis of Otitic Meningitis. Mr. E. Watson Williams will take part in the discussion. Cases and specimens will be shown by Sir James Dundas-Grant, Mr. Bernstein (introduced by Mr. Archer Ryland), Mr. W. M. Mollison, Mr. Norman Barnett, and others. 5 P.M., LARYNGOLOGY. (Cases at 4 P.M.) Demonstration of lamp for local application of ultra-violet rays by Dr. A. Eidinow. Cases and specimens will be shown by the President, Sir James Dundas-Grant, and Mr. Victor Negus. 8.30 P.M., ANÆSTHETICS. Paper: Mr. Stanley Rowbotham: Preliminary Medication in Anæsthetics.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Dec. 3rd, to SATURDAY, Dec. 8th.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Mon., at 5 P.M., lecture by Dr. G. A. Sutherland: Some Cardiac Problems in Childhood.—WELLCOME MUSEUM OF MEDICAL SCIENCE, 33, Gordon-street, W.C. Wed., at 4 P.M., demonstration by Mr Herbert Paterson on Cancer.—ALL SAINTS' HOSPITAL, Vauxhall Bridge-road, S.W. Wed., at 2.30 P.M., clinical demonstration in Urology by Messrs. Attwater, Coyte, Loughnane, and Levy.—HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C. Thurs., at 10 A.M., clinical demonstration by Dr. Robert Hutchison. The above are free.—HOSPITAL FOR DISEASES OF THE SKIN, Blackfriars-road, S.E. Special course, *afternoons only*.—THE INFANTS HOSPITAL, Vincent-square, S.W. Afternoon special course.—WEST END HOSPITAL FOR NERVOUS DISEASES, 73, Welbeck-street, W. At 5 P.M., lecture demonstrations daily. Further particulars from the Secretary.

WEST LONDON POST-GRADUATE COLLEGE, West. London Hospital, Hammersmith, W.

MONDAY, Dec. 3rd.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Simmonds: Surgical Out-patients.

TUESDAY.—11 A.M., Mr. Endean: Venereal Diseases (demonstration). 2 P.M., Dr. Shaw: Medical Out-patients. 2 P.M., Mr. Hamblen Thomas: Throat, Nose and Ear Department.

WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. 2 P.M., Mr. Tyrrell Gray: Operations. 2.30 P.M., Mr. Donald Armour: Surgical Wards. 4.30 P.M., Dr. Carter Braine: X Ray Therapy.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 2 P.M., Dr. Ironside: Medical Out-patients. 2 P.M., Mr. Bishop Harman: Eye Department.

FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department.

SATURDAY.—9 A.M., Mr. Vlasto: Operation on Throat, Nose and Ear. 9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Diseases of Children.

Daily 10 A.M. to 5 P.M., Saturdays 10 A.M. to 12 noon. Medical and Surgical In-patients and Out-patients. Operations, Special Departments, Anæsthetic Course.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL.

MONDAY, Dec. 3rd.—4.15 P.M., Dr. Charles Singer: Diphtheria. Last lecture on the History of Medicine.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Dec. 3rd.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, Dec. 4th.—5 P.M., Dr. W. Griffith: Eczema (1).

THURSDAY.—5 P.M. Eczema (2).

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY, Dec. 6th.—4 P.M., Dr. Schlesinger: Congenital Syphilis.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.

FRIDAY, Dec. 7th.—4 P.M., Mr. Archer Ryland: Œsophagoscopy.

ST. PAUL'S HOSPITAL POST-GRADUATE COURSE. Endell-street, W.C.

THURSDAY, Dec. 6th.—4.30 P.M., Dr. David Thomson: Common Infection of the Genito-urinary Tracts.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.

WEDNESDAY, Dec. 5th.—4 P.M., Dr. R. Fortescue Fox: Rheumatism in Relation to Industry (with lantern illustrations).

CHADWICK PUBLIC LECTURES.

TUESDAY, Dec. 4th.—6.30 P.M. (at the Royal Sanitary Institute, 90, Buckingham Palace-road), Mr. H. C. Adams, M.Inst.C.E.: The Drainage of Basements and Low-lying Areas and the Prevention of Damp.

INSTITUTE OF HYGIENE, 28, Portland-place, W.

WEDNESDAY, Dec. 5th.—3.30 P.M., Dr. R. King Brown: The Use and Abuse of Artificial Sunlight.

NATIONAL INSTITUTE FOR THE DEAF, 2, Bloomsbury-street, W.C.

TUESDAY, Dec. 4th.—8 P.M. (at 40, Chandos-street, W.), Mr. C. M. R. Balbi, A.M.I.E.E.: The Wonders of Hearing. Chairman: Lord Charnwood.

EAST LONDON HOSPITAL FOR CHILDREN, Glamis-road, Shadwell, E.

WEDNESDAY, Dec. 5th.—4 P.M., Cases illustrating the respiratory affections of Children will be shown.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, Dec. 4th.—4.15 P.M., Mr. P. R. Wrigley: Œsophageal Obstruction.

FRIDAY.—4.15 P.M., Prof. H. S. Raper: Obesity.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.

FRIDAY, Dec. 7th.—3.30 P.M., Dr. Barnes: Medical Cases.

MINISTRY OF HEALTH.

ANNUAL REPORT OF THE CHIEF MEDICAL OFFICER, 1927.

(*Continued from p. 941.*)

CANCER.

THE steady annual increase in the *recorded* mortality-rate of cancer, which has been noted for many years past, continues, and in 1927 the total number of deaths attributed to cancer was 54,078, giving a rate per million persons living of 1376. Sir George Newman holds that steady increase of this rate during the last 80 years does not of itself demonstrate an increase in the incidence or mortality of cancer. We cannot accurately assess the improvement in pathological knowledge, the advance in technical equipment and skill, the change in the age-incidence of the population, the newer bases of classification and improvement in diagnosis and methods of treatment. To many minds it seems a highly important question whether cancer is or is not increasing. The fundamental idea underlying the question presumably is that if it could be shown that some other change affecting the population as a whole, which might conceivably be a causal factor in disease, had taken place coincidently with the recorded increased mortality of cancer there would be a prima facie case for inquiring whether there was a connexion between the two events. To regard the matter from this point of view seems to make the tacit assumption that all forms of cancer are due to a single cause. Most of the evidence suggests that this point of view may be misleading, and that the disease is in essence a purely local one, dependent upon some local change in the organ affected. Sir George Newman holds, therefore, that a more valuable line of inquiry than that of attempting to ascertain the measure of an over-all increased mortality which could be correlated with some supposedly ætiological factor would be to confine attention to a single organ at a time, to try to ascertain whether in the case of that organ an increase or decrease is taking place, and, if so, whether any reason for the change can be discovered.

Comparison of the actual number of deaths which were certified during 1926 and the years previous to it as due to cancer of the different organs, and the proportionate frequency with which the deaths were distributed among the organs, shows that though the differences between one organ and another in any given year are considerable, the frequency with which any given organ is affected in adjacent years is of roughly the same order. For this reason the Departmental Committee on Cancer of the Ministry, which has now been in existence for five years, decided to begin by investigating the disease as it affects particular organs. The sites selected for first investigation were the breast, uterus, and rectum. The results of the investigations hitherto undertaken have been published in the Series of Reports on Public Health and Medical Subjects, obtainable from H.M. Stationery Office.

Prevention.

The prime object of a central health authority is, however, prevention of the disease. With present knowledge prevention, as distinct from early and effective treatment, is limited to (1) avoidance of irritation arising out of a few occupational risks leading usually to skin cancer, as in tar, paraffin, and briquette workers, chimney sweeps, mule spinners, aniline dye workers, X ray workers and the like; (2) the treatment of a few conditions, usually the result of chronic irritation or inflammation, recognised as precursors of cancer at certain sites—e.g., in the lip, tongue, and uterus. Pending the acquisition of further knowledge on causation which may open up methods of prevention, the two chief modes of attack open to those concerned with the disease are (*a*) the reduction of mortality by effective treatment, and (*b*) the relief of suffering. Along these two lines the main efforts of the Committee have hitherto been directed.

The main investigations constituting the Committee's programme for the immediate future are:—

(1) Radiological treatment. Technical investigations of its value and administrative inquiries as to how best it can be fostered.

(2) Investigation of certain sites—e.g., skin, mouth, and tongue—with the object of analysing present knowledge and in the hope at a later stage of securing further information on causation and prevention.

(3) Inquiry into the conditions under which patients with inoperable or recurrent cancer pass the remainder of their lives—e.g., the proportion admitted to infirmaries, that remaining at home, treatment available and received, &c.

(4) The accuracy of death certification in cancer and the proportion of cases receiving effective treatment.

(5) Completion of analysis of data already collected respecting cancer of the breast.

The projected inquiry into cancer of certain sites such as the skin, the lip, and tongue is largely based on considerations set out earlier in the report—viz., localisation to areas which either undergo specific forms of irritation, as in the occupational cancers of the skin, or in which cancer is known to follow certain pathological conditions, as in the lip and tongue, which are visible and therefore more readily capable of clinical investigation. Another advantage of this inquiry is its comparability with the experimentally induced cancer in animals. In this group of cancers, skin, lip, and tongue, are to be found those in which our knowledge of causation has some pretensions to accuracy and it is reasonable to suppose that, with adequate facilities for detailed investigation, this knowledge can be increased.

INCIDENCE OF INFECTIOUS DISEASES OF THE NERVOUS SYSTEM, 1914–27.

Disease.	1914.	1915.	1916.	1917.	1918.	1919.	1920.	1921.	1922.	1923.	1924.	1925.	1926.	1927.
Cerebro-spinal fever	315	2566	1306	1465	798	848	583	411	344	301	397	402	385	470
Acute poliomyelitis	509	517	689	357	228	553	293	488	355	587	777	371	1159	801
*Polio-encephalitis	—	—	—	—	—	62	36	51	31	57	83	51	138	95
*Encephalitis lethargica ..	—	—	—	—	—	541	890	1470	454	1025	5039	2635	2267	1615

* Made notifiable Jan. 1st, 1919.

INFECTIOUS DISEASES OF THE NERVOUS SYSTEM.

The only diseases of the nervous system which any public health measures can directly influence are those which are to some extent infectious, such as poliomyelitis, polio-encephalitis, cerebro-spinal fever, and encephalitis lethargica. The incidence of these diseases, as shown by notification returns, 1914–27 inclusive, is shown in the table.

These figures show that the reported prevalence of encephalitis lethargica and acute poliomyelitis was considerably less than that during 1926; the 1927 figures for poliomyelitis are still higher than usual, but this is due to the fact that a considerable number of cases belonging to the season of 1926 occurred in the early part of 1926. The figures for polio-encephalitis and cerebro-spinal fever are also above the average for recent years.

In 1926 encephalitis lethargica and acute poliomyelitis were most prevalent in the first and third quarters of the year respectively, while cerebro-spinal fever, as usual, was chiefly prevalent in the winter months. It is satisfactory to note that the number of notified cases of encephalitis lethargica is 652 less than in the previous year and that since the

peak year of 1924 there has been a progressive decline in the reported incidence of this disease. Among the attempts to deal with the administrative problems of post-encephalitis lethargica, the "encephalitis unit" at Winchmore Hill continues to fulfil a very useful function in the case of juvenile patients mainly from the metropolitan area, and owing to the diminishing demands of London cases, extra-metropolitan applications for admission have been considered and a certain number met.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY, Albemarle-street, W.

THURSDAY, Dec. 6th.—4.30 P.M.—*The following papers will be read:* A. E. Boycott, F.R.S., C. Diver, S. Hardy, and F. M. Turner: The Inheritance of Sinistrality in Limnæa Peregra. R. H. Burne, F.R.S.: A System of "Fine" Vessels associated with the Lymphatics in the Cod (*Gadus Morrhua*). E. Hindle: Further Observations on Chinese Kala-azar. *The following papers will be read in title only:* Eric Ponder: Hæmolysis by Brilliant Green and Serum. (Communicated by Sir E. Sharpey Schafer, F.R.S.) A. V. Hill, F.R.S., Grace Eggleton, and P. Eggleton: The Coefficient of the Diffusion of Lactic Acid through Muscle. C. H. Best, K. Furusawa, and J. H. Ridout: The Respiratory Quotient of the Excess Metabolism of Exercise. (Communicated by A. V. Hill, F.R.S.) A. V. Hill, F.R.S., and W. Hartree: The Energy Liberated by an Isolated Muscle during the Performance of Work. A. V. Hill, F.R.S.: The Diffusion of Oxygen and Lactic Acid through Tissues. (Parts I., II., III., and IV.) D. Keilin, F.R.S.: Cytochrome and Respiratory Enzymes. F. R. Miller and N. B. Laughton: Myograms yielded by Faradic Stimulation of the Cerebellar Nuclei. (Communicated by A. B. Macallum, F.R.S.) D. Burk: The Free Energy of Glycogen-Lactic Acid Breakdown in Muscle. (Communicated by A. V. Hill, F.R.S.) F. C. Smith: The Ultra-violet Absorption Spectra of certain Aromatic Amino-acids and of the Serum Proteins. (Communicated by C. Lovatt Evans, F.R.S.)

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Dec. 4th.—8.30 P.M., ORTHOPÆDICS. A discussion on the Stiff and Painful Shoulder. Opener: Mr. George Perkins. Other speakers: Mr. McCrae Aitken, Mr. Alan Todd, Dr. Alexander Mercer, Mr. J. R. Lee, Mr. B. Whitchurch Howell, Dr. Brailsford, and others. 8 P.M., PATHOLOGY. Laboratory meeting at St. Bartholomew's Hospital. Demonstrations: M. H. Gordon and W. J. Tullock: Antibodies to Vaccine Virus. E. A. Carmichael: Microglia. L. P. Garrod: [illegible] ts. T. H. G. Shore: [illegible] W. Shaw: Krukenl [illegible] B. Hume: Unusual Forms of Hydronephrosis. T. Jockes and F. H. K. Green: Infectious Anæmia in Rats. Surgical Unit: Pathological Specimens. R. G. Canti: Cinematograph of Tissue Cultures Under Dark Ground Illumination.

WEDNESDAY.—4.30 P.M., SURGERY (at Guy's Hospital). Operations. Demonstration of cases.

THURSDAY.—8.15 P.M., TROPICAL DISEASES. Paper: Dr. H. Harold Scott and Dr. H. B. Day: Clinical and Pathological Correlation in Typhoid and Allied Diseases.

FRIDAY.—10.30 A.M., OTOLOGY. (Cases at 9.30 A.M.). Discussion on Meningitis. Papers will be read by: Mr. G. J. Jenkins, Mr. T. B. Layton: An Otitic Meningism; and Mr. E. D. Davis: The Morbid Anatomy, Prevention, and Early Diagnosis of Otitic Meningitis. Mr. E. Watson Williams will take part in the discussion. Cases and specimens will be shown by Sir James Dundas-Grant, Mr. Bernstein (introduced by Mr. Archer Ryland), Mr. W. M. Mollison, Mr. Norman Barrett, and others. 5 P.M., LARYNGOLOGY. (Cases at 4 P.M.) Demonstration of lamp for local application of ultra-violet rays by Dr. A. Eidinow. Cases and specimens will be shown by the President, Sir James Dundas-Grant, and Mr. Victor Negus. 8.30 P.M., ANÆSTHETICS. Paper: Mr. Stanley Rowbotham: Preliminary Medication in Anæsthetics.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Dec. 3rd, to SATURDAY, Dec. 8th.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Mon., at 5 P.M., lecture by Dr. G. A. Sutherland: Some Cardiac Problems in Childhood.—WELLCOME MUSEUM OF MEDICAL SCIENCE, 33, Gordon-street, W.C. Wed., at 4 P.M., demonstration by Mr Herbert Paterson on Cancer.—ALL SAINTS' HOSPITAL, Vauxhall Bridge-road, S.W. Wed., at 2.30 P.M., clinical demonstration in Urology by Messrs. Attwater, Coyte, Loughnane, and Levy.—HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C. Thurs., at 10 A.M., clinical demonstration by Dr. Robert Hutchison. The above are free.—HOSPITAL FOR DISEASES OF THE SKIN, Blackfriars-road, S.E. Special course, afternoons only.—THE INFANTS HOSPITAL, Vincent-square, S.W. Afternoon special course.—WEST END HOSPITAL FOR NERVOUS DISEASES, 73, Welbeck-street, W. At 5 P.M., lecture demonstrations daily. Further particulars from the Secretary.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, Dec. 3rd.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Simmonds: Surgical Out-patients.

TUESDAY.—11 A.M., Mr. Endean: Venereal Diseases (demonstration). 2 P.M., Dr. Shaw: Medical Out-patients. 2 P.M., Mr. Hamblen Thomas: Throat, Nose and Ear Department.

WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. 2 P.M., Mr. Tyrrell Gray: Operations. 2.30 P.M., Mr. Donald Armour: Surgical Wards. 4.30 P.M., Dr. Carter Braine: X Ray Therapy.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 2 P.M., Dr. Ironside: Medical Out-patients. 2 P.M., Mr. Bishop Harman: Eye Department.

FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department.

SATURDAY.—9 A.M., Mr. Vlasto: Operation on Throat, Nose and Ear. 9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Diseases of Children.

Daily 10 A.M. to 5 P.M., Saturdays 10 A.M. to 12 noon. Medical and Surgical In-patients and Out-patients. Operations, Special Departments, Anæsthetic Course.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL.

MONDAY, Dec. 3rd.—4.15 P.M., Dr. Charles Singer: Diphtheria. Last lecture on the History of Medicine.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Dec. 3rd.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, Dec. 4th.—5 P.M., Dr. W. Griffith: Eczema (1).

THURSDAY.—5 P.M. Eczema (2).

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY, Dec. 6th.—4 P.M., Dr. Schlesinger: Congenital Syphilis.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.

FRIDAY, Dec. 7th.—4 P.M., Mr. Archer Ryland: Œsophagoscopy.

ST. PAUL'S HOSPITAL POST-GRADUATE COURSE, Endell-street, W.C.

THURSDAY, Dec. 6th.—4.30 P.M., Dr. David Thomson: Common Infection of the Genito-urinary Tracts.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.

WEDNESDAY, Dec. 5th.—4 P.M., Dr. R. Fortescue Fox: Rheumatism in Relation to Industry (with lantern illustrations).

CHADWICK PUBLIC LECTURES.

TUESDAY, Dec. 4th.—6.30 P.M. (at the Royal Sanitary Institute, 90, Buckingham Palace-road), Mr. H. C. Adams, M.Inst.C.E.: The Drainage of Basements and Low-lying Areas and the Prevention of Damp.

INSTITUTE OF HYGIENE, 28, Portland-place, W.

WEDNESDAY, Dec. 5th.—3.30 P.M., Dr. R. King Brown: The Use and Abuse of Artificial Sunlight.

NATIONAL INSTITUTE FOR THE DEAF, 2, Bloomsbury-street, W.C.

TUESDAY, Dec. 4th.—8 P.M. (at 40, Chandos-street, W.), Mr. C. M. R. Balbi, A.M.I.E.E.: The Wonders of Hearing. Chairman: Lord Charnwood.

EAST LONDON HOSPITAL FOR CHILDREN, Glamis-road, Shadwell, E.

WEDNESDAY, Dec. 5th.—4 P.M., Cases illustrating the respiratory affections of Children will be shown.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, Dec. 4th.—4.15 P.M., Mr. P. R. Wrigley: Œsophageal Obstruction.

FRIDAY.—4.15 P.M., Prof. H. S. Raper: Obesity.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.

FRIDAY, Dec. 7th.—5.30 P.M., Dr. Barnes: Medical Cases.

Appointments.

MACLEOD, C. B., M.B., Ch.B. Glasg., has been appointed one of the Medical Referees under the Workmen's Compensation Act for the Island of Lewis.

PEIRSON, T., M.B., Ch.B. Manch., D.P.H., Deputy Medical Officer of Health for Gateshead.

Vacancies.

For further information refer to the advertisement columns.

Albert Dock Hospital, Connaught-road, E.—Res. M.O. At rat of £110.
Barnsley, Beckett Hospital.—Jun. H.S. At rate of £140.
Barnstaple, North Devon Infirmary.—H.S. At rate of £150.
Bedford, Bedfordshire Education Committee.—School Dentist. £500.
Belfast, Joint Nursing and Midwives' Council for Northern Ireland.—Examiners.
Bihar, India, Jharia Mining Settlement.—Chief M.O. 1200 Rs. a month.
[illegible] *spital.*—Asst. Ophth. Surgeon. £50.
[illegible] *ospital.*—Cas. O. At rate of £250.
[illegible] —Hon. Ophth. Surg.
[illegible] *ns Disease Hospital and Sanatorium.*—
[illegible] *Hospital and Sanatorium.*—Asst. Res. M.O. £300.
Cambridge, Addenbrooke's Hospital.—H.S. At rate of £130.
Cottingham, E. Yorks, Tuberculosis Sanatorium.—Res. M.O. £485.
Derby, Derbyshire Royal Infirmary.—Two H.S.'s. Each at £150.
Dorset Mental Hospital, Herrison, Dorchester.—Jun. Asst. M.O. £300.
Dreadnought Hospital, Greenwich, S.E.—Asst. Pathologist to London School of Clin. Med. £350. Med. Supt. £300. Also H.P. and H.S. Each at rate of £110.
Dumfries, Crichton Royal Mental Hospital.—Clin. Path. £400.
East Ham Memorial Hospital, Shrewsbury-road, E.—Res. M.O. and Res. H.P., and Cas. O. At rate of £150 and £100 respectively.
Hampstead General and North-West London Hospital, Haverstock-Hill, N.W.—H.S. Also H.P. Each at rate of £100.
Haywards Heath, Sussex, King Edward VII. Memorial, Eliot [illegible] sthetist.
[illegible] hair of Medicine. £800.
[illegible] *Great Ormond-street, W.C.*—Surgeon.
Hull Royal Infirmary.—Cas. H.S. At rate of £130.
Kirbymoorside, Yorkshire Children's Orthopædic Hospital.—H.S. £150.
Liverpool, Fazakerley Sanatorium.—Asst. Res. M.O. £250.
Liverpool, Hahnemann Hospital, Hope-street.—Stipendiary M.O. At rate of £125. Res. M.O. At rate of £100. Also Clin. Asst.
London Lock Hospital, 91, Dean-street, W.—H.S. At rate of £200.
Luton Borough.—Asst. M.O.H., &c. £600.
Manchester, Ancoats Hospital.—Orthopædic Registrar. Also Med. Registrar. £100.
Manchester, Salford Royal Hospital.—Res. Surg. O. £200. H.P.'s. and H.S.'s. Also Cas. H.S. Each at rate of £125.
Metropolitan Hospital, Kingsland-road, E.—Asst. Surg. Also Res. Cas. O. At rate of £100.
National Hospital, Queen-square, W.C.—H.P. £150.
Prince of Wales's General Hospital, Tottenham, N.—Hon. Anæsthetist. £20. Also Hon. Clin. Assts.
Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—District Res. M.O. Also Asst. Res. M.O. Each at rate of £80.
Royal Dental Hospital, 32, Leicester-square, W.C.—Hon. Anæsthetist.
Royal Northern Hospital, Holloway, N.—H.S. At rate of £70.
St. Leonard's-on-Sea, Buchanan Hospital.—Jun. H.S. £100.
St. Luke's Infant Welfare Centre, Peckham, S.E.—Medical Woman required.
St. Marylebone Hospital, W.—Visiting Consulting Neurologist. £100.
St. Peter's Hospital for Stone, &c., Henrietta-street, Covent Garden, W.C.—Clin. Assts.
Salisbury, General Infirmary.—Pathologist. £1000.
Shanghai Municipal Public Health Dept.—Asst. Radiologist. Also Asst. Pathologist. 700 and 650 taels per month respectively.
Sheffield University.—Sen. Demonstratorship in Anatomy. £400.
[illegible] *Council.*—County M.O.H. £1100.
[illegible] £250.
[illegible] *ry.*—H.S. £170.
[illegible] *nsington, S.W.*—Geoffrey Duveen
[illegible] Oto-Rhino-Laryngology. £450.
[illegible] At rate of £150.
York County Hospital.—H.S. £150.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Walton-on-the-Naze (Essex), and Horsmonden (Kent).

COVENTRY AND WARWICKSHIRE HOSPITAL.—The governors of this hospital have decided to purchase for £65,000 the adjoining Coventry City Infectious Diseases Hospital. The acquisition will enable the accommodation to be increased ultimately by 102 beds, an administrative block, and quarters for 32 nurses.

THE KING'S ILLNESS.

OFFICIAL BULLETINS.

THE following is the text of the official bulletins which have been issued during the King's illness by Sir Stanley Hewett and Lord Dawson of Penn:—

WEDNESDAY, NOV. 21ST. 8 P.M.

His Majesty the King is suffering from a cold with some fever and is remaining in bed.

THURSDAY, NOV. 22ND. 8 P.M.

His Majesty has passed a restless day owing to persistence of the fever. There is some congestion of one lung.

FRIDAY, NOV. 23RD. 11.45 A.M.

The King passed a restless night, the temperature remaining at 101° There is a slight extension of the mischief in the lung, but His Majesty's strength is maintained.

8 P.M. The King has had a quieter day; the temperature is lower and there is no further extension of mischief in the lung.

SATURDAY, NOV. 24TH. 11.15 A.M.

The King has passed a fair night, and the improvement noted last evening is maintained. The pleurisy which commonly accompanies this type of congestion of the lung continues to be a prominent feature.

7.45 P.M. The King has passed a quiet day. The condition of the lung is unchanged.

SUNDAY, NOV. 25TH. 7.45 P.M.

The King has had a disturbed day due to an increase in the fever. The strength is maintained.

MONDAY, NOV. 26TH. 10 A.M.

The King has passed a restless night. The variability in the fever and the spread of the pleurisy must be expected at this stage of the illness.

8.30 P.M. His Majesty the King has not had a comfortable day. The temperature is now 101·6°, but the pleurisy has not extended further, and the strength is maintained.

TUESDAY, NOV. 27TH. 11 A.M.

His Majesty the King has had a more restful night, and the temperature is somewhat lower. Conditions are otherwise unchanged.

8.30 P.M. The King has passed a less disturbed day; the temperature is somewhat lower than at the corresponding hour last night; the strength is maintained.

WEDNESDAY, NOV. 28TH. 10 A.M.

The King has passed a quieter night. The temperature and general condition remain as before.

2 P.M. (in a letter to the Cabinet). The King is suffering from inflammation (congestion) of the right lung with extensive plastic pleurisy on the right side, which as you know is a painful condition. Such an infection must from its nature be serious. In all illnesses of this character there must be anxiety, which will continue for the present, but I am happy to say that the King passed a quieter night, that the condition of the lung shows some improvement, and that his strength is maintained. So far, then, the illness is being controlled, its force lessened, its symptoms alleviated, and I hope its duration will be curtailed.

8.30 P.M. The King has passed a fair day, with some sleep. Otherwise conditions are unchanged.

REBUILDING OF MIDDLESEX HOSPITAL.—It is expected that shortly before Christmas it will be possible to remove the scaffolding from the new west wing, six storeys high, though this part of the building may not be ready for occupation until next autumn. There will be 12 large wards in this wing, the ground floor of which will be occupied by secretarial and other administrative offices.

Bradshaw Lecture

ON

AXIAL ROTATION, PURPOSEFUL AND PATHOLOGICAL.

Delivered before the Royal College of Surgeons of England on Nov. 8th, 1928,

BY C. H. FAGGE, M.S. LOND.,
MEMBER OF THE COUNCIL OF THE COLLEGE: SURGEON TO GUY'S HOSPITAL.

Of the Dog called Turnespete in Latine Vertiscator.

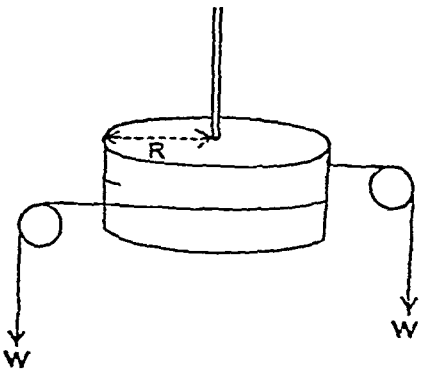
THere is comprehended, vnder the Curres of the courtiell kinde, a certaine dog in kitchen-seruice excellent: For when any meat is to be roasted, they go into a wheel, which they turning round about with the weight of their bodies, so diligently looke to their businesse, that no drudge nor seruitor can do the same more cunningly. Whom the populas for hereupon call Turnespets, being the last of all those which wee haue first mentioned.

The History of Foure-footed Beasts.
TOPSELL 1607

THE necessities of existence must have forced upon man from his earliest days the consideration of mechanical problems. In what form rotation was first appreciated by him we do not know, but palæolithic man has handed down to us the bow drill which besides enabling him to perforate stones, also provided him with one of the earliest methods of kindling fire. With truth Aristotle, who died in the year 322 B.C., described man as a "tool-making animal," for the finding of tools of an earlier period at any spot is now accepted by archæologists as conclusive evidence of former human habitation. The pump drill (Fig. 1) is of later date and is attributed by Seerig to Hippocrates, 400 B.C., although Flinders Petrie says that it was not known before Roman days. This implement well exemplifies the action of rotation due to a couple and shows how the power expended as the cord unwinds is recovered as it rewinds itself in the reverse direction round the spindle of the drill. But not until Archimedes, about 200 B.C., laid down the principles of helical motion was it realised that not only translation but also spiral or helical motion of a nut could be brought about by rotation of a screw. Here we perceive the discovery of a fundamental principle of mechanics, and from it may be traced the birth of much of the machinery of the present day. To surgeons the interest lies not in the helical motion of the nut upon the screw but in the axial rotation of the screw upon the nut, as shown in the mechanism of the drill designed by the Syracusian scientist over 2000 years ago and still part of our professional outfit. Yet in spite of the discovery of Archimedes, mechanics made comparatively slow progress, both theoretically and practically, until the Newtonian age, when in 1686, less than 250 years ago, Isaac Newton set down his laws of motion.

I am told that my title, Axial Rotation, has no exact mechanical sense, but it is well understood in surgical pathology as meaning the rotation of a body about its central vertical axis. When we reduce this motion to mechanical terms, we find that rotation of this kind is brought about either by the action of a couple consisting of two forces, equal, parallel and opposite, or of one force and a reaction which is a resistance acting in an opposite direction. The twisting action of the moment of this couple can be represented by the following formula, in which ϕ indicates the angle of rotation, a the radius of wire or pedicle and n its modulus of rigidity, or specific capacity for resistance to torsion.

The formula and diagram are introduced only because they help us to a broad conception of the magnitude of the forces required to form a couple so as to cause rotation of a living pedunculated mass. Clearly the magnitude of C is in ratio to the value of a, l, and n; while the greater the value of R the less will be that of W. Whereas n, the modulus of rigidity of a suspending wire, is a constant of known value, we know nothing of the modulus of rigidity of a living pedicle. If the pedicle is thin the forces required to produce a given twist may be small, but a thick pedicle like the body of the uterus must have a very high resistance to torsion, as this is proportionate to the fourth power of its radius. Further, even if n is low during the first half-turn of a living pedicle, it will increase enormously when the twists are becoming tight.



$$2WR = C = \frac{\pi^2 a^4 n}{360\, l}\,\phi$$

n = modulus of rigidity of wire
l = length of wire in centimetres
a = radius of wire
ϕ = angle of twist in degrees
C = moment of couple of forces
R = radius of drum
W = weight or force

Mr. T. W. Adams, demonstrator of physics at Guy's, has carried out some experiments with the object of finding out the factors which influence torsion of a pedicle. By running water through a twisted rubber tube, representing the artery of a pedicle, he finds that forces are set up which tend to oppose the twisting couple; this may be considered as equivalent to increasing n. If this conclusion can be applied to living tissues it would suggest that the arterial pressure in a living pedicle opposes the forces which twist it, so that n, its modulus of rigidity, is raised until it reaches a limiting value and rotation ceases. If this be accepted, arterial pressure is a natural protection against torsion. This conclusion is in accordance with another common experiment; when watering a lawn with a long hosepipe one is constantly reminded that the force of the water in the pipe tends to undo twists.

PURPOSEFUL ROTATION.

Therapeutic Rotation.

As a surgical operation axial rotation is recognised in two distinct and widely different fields. Our modern ideas on arterial torsion for hæmostasis are due to Amussat,[1] even though his experiments on living animals and on man a hundred years ago—at the time critically discussed and apparently regarded as original by his peers, Lisfranc and Larrey—had been forestalled by the Pneumatists: for to Heliodorus, Archigenes, and Antyllus, who in the first century were in surgery the equals of Celsus in medicine, torsion of bleeding vessels was a recognised method, apparently even then of some antiquity, as they made no claim to originality in its use. Prof. A. Chauffard, of Paris, has been kind enough to supply me with a précis of a thesis by Magon[2] in which Amussat's work and that of his successors is reviewed; he recalls that torsion of arteries was employed by MacCormac at Sedan in over a hundred cases. Castration by torsion is employed in veterinary surgery, chiefly in birds and small domestic animals, in order to render a male bird or animal used for the table more tender for the epicure. By some this method is preferred to ligature which, according to Hobday,[3] is liable to be followed by tetanus. The method is known as *bistournage* and may be employed in two ways; in this country the cord is clamped and the testis then twisted off, but alternatively the testis and cord may be isolated and the testis rotated

four or five times and left to atrophy. Prof. A. Chauveau,[4] in his classical observations on pathology written in 1873, used this common operation to illustrate his views. He states that if the arteries of the twisted cord were injected after death the coloured material did not pass beyond the twists. Tissue necrosis followed by atrophy of the testis resulted, and this Chauveau regarded as an example of tissue death unassociated with putrefaction. Yet, as Roche[5] points out, "in pathological torsion, redness and œdema result from inflammation due to the damaged testicle, which acts as a foreign body." This difference may be explained on the hypothesis put forward by Bonney[6] in a paper contrasting the effects of "occluding and suboccluding ligatures" on the tissues distal to them. He argues that the former produce a condition of white infarction—the aseptic death of Chauveau—whereas red infarction results when the circulation is incompletely cut off by a suboccluding ligature. Thus we may assume that in therapeutic torsion the circulation is completely destroyed, but that pathological torsion may fall short of this and produce a condition of red infarction in which infection with secondary inflammatory reaction is probable.

Embryonic Rotation.

The human embryo affords an example of rotation in the changes which occur in the position of the midgut between the fifth and tenth weeks. (Fig. 2.) Up to the former date this loop, with its artery of supply, the superior mesenteric, as its axis, lies in the sagittal plane within the cœlomic cavity and is connected with the yolk-sac through the vitelline duct. Two changes now occur: the midgut loses its distal attachment within the umbilical cord by atrophy of the vitello-intestinal duct and—perhaps owing to its relative rapid increase in length—the greater part of the midgut passes through the umbilical orifice into the diverticulum of the cœlomic cavity which lies in the base of the umbilical cord (Fig. 3).* We do not know why the midgut passes beyond the abdominal wall; it has been suggested that this is due to the rapid increase in the size of the liver, but as the midgut is drawn back into the abdomen within a few weeks, during which time there is little relative reduction in the size of the liver, this explanation is difficult to accept. Fraser and Robbins[7] have described the formation of traction or retention bands in the base of the mesentery at both extremities of the midgut. These approximate the duodenal and colic angles, forming a narrow isthmus to the loop; it is about this, the duodeno-colic isthmus, that rotation takes place (Fig. 4). Emphasis is laid upon the fact that rotation begins while the midgut loop is in part within the umbilical stalk, and also upon the necessity, if rotation is to be properly carried out, of the reduction of the loop into the abdomen in a set order, the last portion to be reduced being the bulky cæcum. This would suggest that a drag or obstacle to reduction is necessary for the accurate performance of rotation. This drag may be provided by the bulky cæcum fitting snugly in the umbilical ring, and it is possible that one factor in incomplete rotation may be an unduly large umbilical orifice. The effect of this drag is to keep the two limbs of the midgut parallel and near together and, with the formation of a narrow base by traction bands, to bring about physical conditions favourable to rotation—a ship only swings at anchor when the cable is taut. In Dott's[8] opinion the left umbilical vein, carried downwards and to the right by the enlarging liver, exerts pressure on the cephalic limb of the midgut, pushing it downwards and to the right so that the caudal limb is displaced to the left. This suggestion that the position of the midgut is determined by the pressure of a soft, yielding structure, the umbilical vein, is not convincing. Fraser and Robbins suggest that the returning small intestine assists in rotation of the loop by pushing its caudal limb backwards and to the left. This explanation also is barren of proof; we know nothing of the forces which determine the return of the small gut, and until we do we cannot with any certainty attribute any purposeful action to the bowel itself. Further, our difficulty in explaining these occurrences is not lessened by the fact that rotation of the midgut is almost constant; variations or defects are extremely uncommon, for Dott found only 45 records of gross developmental error. It is not easy to attribute to a more or less chance position of a piece of small intestine the determining of changes which so rigidly follow a uniform plan.

When the "second stage of rotation" (Dott) is complete, the midgut loop has rotated in its different parts to a variable degree, which is at its maximum some 270°, and lies in such a position that zygosis, the adhesion of opposed peritoneal surfaces, can occur (Fig. 5). Rotation of the midgut is purposeful; by whatever agency it is brought about it is very rarely imperfect. When it is the error is always one of omission; embryonic rotation is never excessive, never goes beyond the normal, and never leads to vascular changes which would imperil the vitality of the small bowel. It may be that the arterial pressure in its pedicle prevents this; if so, it exemplifies the protective mechanism of the increasing value of n (modulus of rigidity or capacity for resistance to torsion).

Rotation of the Fœtus.

Another instance of axial rotation is that which results in the numerous spirals of the umbilical cord which, according to Grosser,[9] are left-handed in 80 per cent. These are true spirals in which both the arteries and vein are involved, as is well shown in Fig. 6, and also by an exhibit kindly lent from the museum of St. Thomas's Hospital. By some it is said that the arteries twist round the vein; this appearance is an illusion, as is shown if two pieces of coloured string are twisted with a plain thicker piece of string. If the thicker piece representing the vein be made taut, the coloured strings representing the arteries appear to twist round the vein, but if the coloured strings be pulled tight it appears that the thicker piece representing the vein is twisted round the arteries. Yet in both cases the same twist has occurred (Fig. 7). During the second and third months of its life "as an aquatic parasite within its mother," as Bland-Sutton[10] so aptly expresses it, the fœtus floats freely in the amniotic fluid, and it is during this period that the spirals in the cord are produced. At first sight it appears to be obvious that they are an index of fœtal activity and that the embryo paddles itself round and round, but although the fœtal movements begin at a very early stage of intra-uterine life I am not convinced that they are strong enough for this purpose, even though little force would be necessary at this stage. Other movements of the fœtus, such as intra-uterine respiratory movements, including hiccough, cannot be advanced as factors in rotation, as they do not occur within the early months of intra-uterine life. In discussing the production of these twists G [illegible] 's hypothesis as a plausible [illegible] r, experimenting with raw and boiled eggs, found that, when spun with the fingers and then checked, the contents of the unboiled egg continue to rotate. According to this theory, rotary movements of the mother would occasion rotation of the fœtus, but if it be a fact that the spirals are in one direction four times out of five this explanation cannot be upheld. If we knew in which direction the limbs of the stronger side of the body would rotate the fœtus we might venture to surmise that this preponderance of left-handed spirals is associated with the preponderance of right-handedness, even though the relative proportions do not correspond.

We know one or two facts which shed some light on the method of production of these spirals and their function. The first is that the spirals never become so numerous or so acute as to cause the death of the fœtus, and the second is that should the fœtus die from another cause the spirals may increase enormously; in one specimen 380 have been

* Figs. 2, 3, 4, and 5 are reproduced from N. M. Dott's paper in the British Journal of Surgery, 1923, xi., 251.

counted.[12] This latter fact casts doubt on the hypothesis that the spirals result from fœtal activity, but both statements suggest that so long as the fœtus is alive there is some mechanism which hinders over-twisting of the cord. In my opinion the chief influence can only be the flow of the fœtal blood through the umbilical artery, though the length of the cord and the time factor (by which I mean the relatively slow formation of spirals) are undoubtedly important. If this argument be accepted, it supports the hypothesis that there exists in the normal blood pressure within the artery of any pedicle a natural agency by which over-twisting is prevented and by which rotation of a degree insufficient to interfere with the blood-supply may be spontaneously reversed.

FIG. 1.

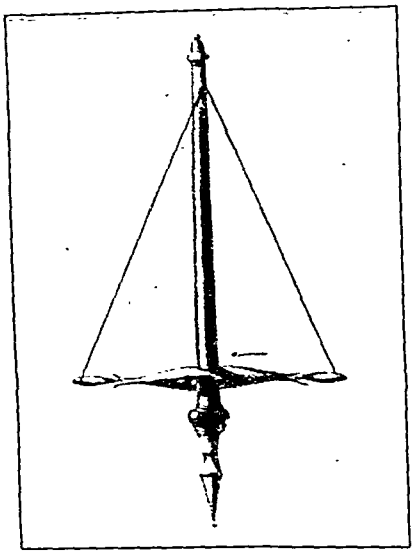


FIG. 2.

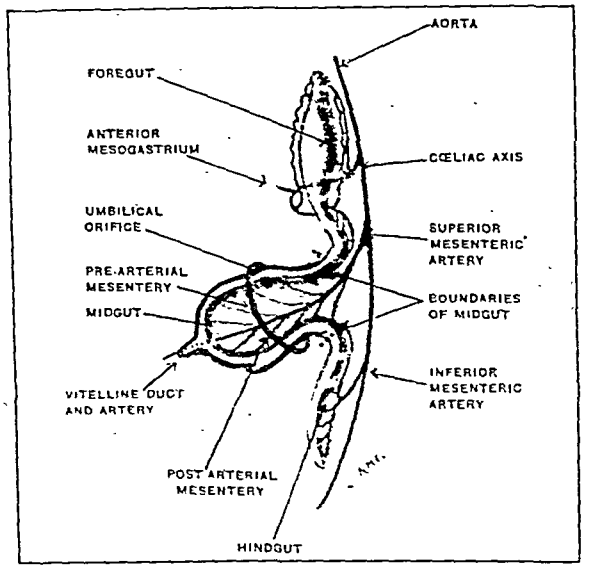


FIG. 3.

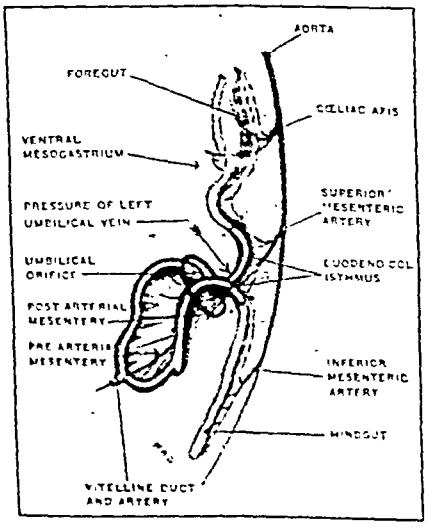
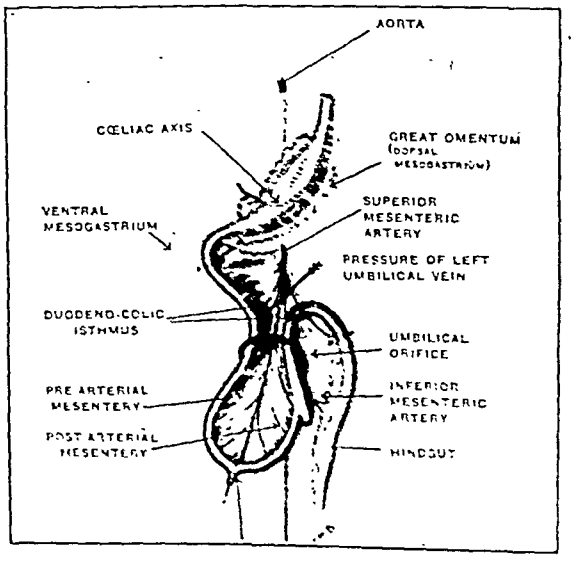


FIG. 4.



PATHOLOGICAL ROTATION.

Rotation of the Testis.

Torsion of the cord in the male with axial rotation of the testis appears to be closely associated with errors of descent. That this is an association of cause and effect is difficult to prove, for cryptorchism is common in domestic animals[13]—e.g., the dog—yet I have been able to discover only one known specimen of axial rotation of the testis in the dog. In man, while torsion of the cord occurs more frequently when the testis is imperfectly descended, it may occur when the testis is in the scrotum, yet even in this case anatomical abnormalities exist similar to those present in axial rotation of an undescended testis. Every specimen I have been able to examine has confirmed this statement. No. 2079 Guy's Hospital Museum provides a good example. The patient was admitted under Mr. Howse in 1892 with the left testicle and cord greatly swollen, "both testicles had always been in the scrotum." The left testis was found twisted upon itself in the axis of the cord "three times round." The anatomical conditions are exactly those described below. Torsion usually takes place an inch or more above the testis within the cavity of the tunica vaginalis; this, the commoner type, involves the whole testis, but when the testicular mesorchium is

long, torsion may take place there, so that the epididymis is not affected.

Numerous authors have drawn attention to the fact that the rotated testis is always inverted (Godard used the term "reversed" in the same sense); this is proved by finding the hydatid of Morgagni below the testis (see Fig. 8). The inversion is brought about by or results in an absence of the normal adhesion of the vas to the posterior surface of the epididymis. Further, by taking into account the side to which the testis belongs and the position of the digital fossa, it is seen that the testis becomes reversed owing to this inversion so that the right appears to be the left and vice versa.

FIG. 5.

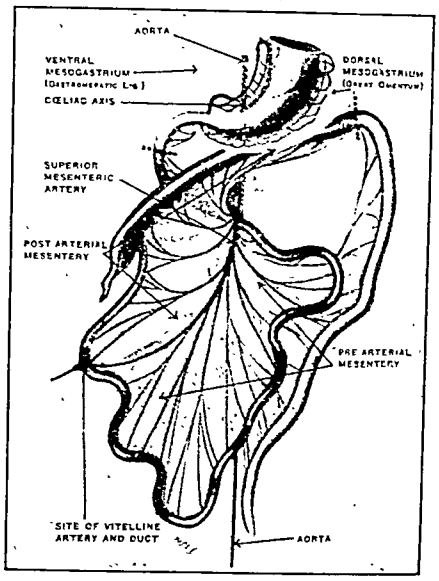


FIG. 6.

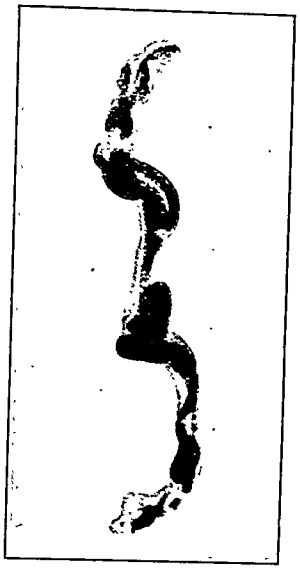
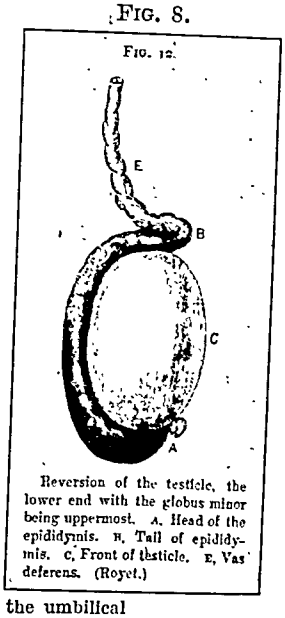


FIG. 8.

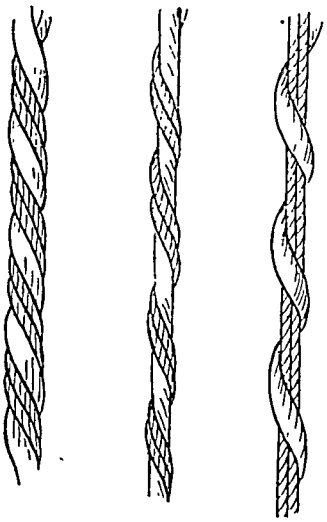


Reversion of the testicle, the lower end with the globus minor being uppermost. A, Head of the epididymis. B, Tail of epididymis. C, Front of testicle. E, Vas deferens. (Royet.)

FIG. 6.—Radiogram of umbilical cord, in which one umbilical artery and the umbilical vein have been injected.

FIG. 8.—From W. H. A. Jacobson's "Diseases of the Male Organs of Generation." (J. and A. Churchill, London, 1893.)

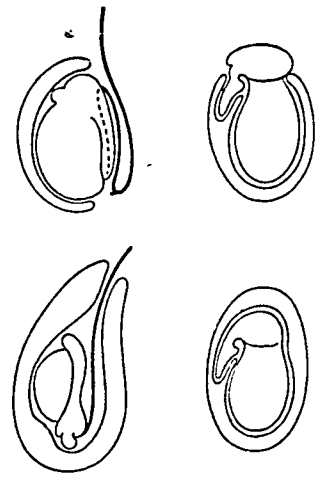
FIG. 7.



But there is also a constant and, to my thinking, a more important abnormality of the peritoneal investment of the testis; this, instead of being reflected from the side of the epididymis on to the scrotal tunics, completely covers the testis proper and the epididymis, its reflection taking place some distance up the cord (Fig. 9). Thus there is no posterior connexion of the testis to the scrotum, and the common urogenital mesentery from which the mesorchium is derived becomes thinned and elongated, providing a condition most favourable to rotation. As I regard this anatomical defect as the chief predisposing cause of torsion, I should like to record that it was demonstrated by the late Mr. J. H. Targett, in my student days pathological curator of the Hunterian Museum. I cannot find that he published his observation, nor is it realised by most teachers of surgical pathology. Keith,[14] in his work on embryology, evidently appreciates this condition, but naturally leaves the anatomical details undescribed. Other writers, such as Edington,[15] who says "in my case the epididymis was completely intratunical," seem to regard the condition as exceptional, yet I believe it to be constant, as it occurs in every specimen I have come across. From Keith's figure (Fig. 10) we see that the gubernaculum has failed to obtain an attachment to the testis and has picked up the vas. I have not recognised this condition in any specimen in London museums; to me it appears more reasonable to regard the gubernaculum as absent in so far as its attachment to the testis or vas is concerned, and to associate this defect with the maldescent of the organ and the abnormality of its peritoneal investment.

Even now we have only arrived at some understanding of the factors predisposing to axial rotation of the testis; of the actual exciting cause we know nothing. It is easy to realise that a testis swinging by a long mesentery in the general peritoneal cavity may become twisted by those agents which affect any similarly situated abdominal tumour, but how rotation occurs when the testis lies over the inguinal canal or in the scrotum I am unable to surmise. I find it hard to accept oft-quoted agents such as blows, and no movement of the thigh or of the abdominal wall can, in my judgment, supply the components of the couple which, according to my hypothesis, is essential for the production of rotation.

FIG. 9.



Since these pages were written and the figures prepared, Mr. Roche has published a carefully thought-out paper on this question. He appreciates most of the anatomical abnormalities to which I have drawn attention, although apparently he does not regard them as constant. He describes one rotated testis removed by himself as "not inverted"; I have been allowed to examine this specimen and

see no reason to regard it as the only exception to the uniform rule. He argues with much cogency that inversion is the result of an endeavour on the part of nature to allow an incompletely descended testis to reach the scrotum. Fascinating as this idea is, it appears to me to be untenable, owing to the fact that inversion is also present in every case of rotation of a normally descended testis.

Intraperitoneal Rotation.

We have the authority of Bland-Sutton[16] for the statement that a variety of abdominal tumours and any abdominal organ except the liver may undergo rotation. He writes "that a tumour hanging freely in the belly should, by mere alteration of the position of the body or by motion imparted to it by a tumult of the bowels, spin round and twist its pedicle, is as comprehensible as the fact that a good weathercock moves in varying directions under the influence of the wind." This is an inimitable word picture, but does not help to explain the mechanics of the rotation. Axial rotation is appreciated as a clinical entity in the acute phase only, yet there is evidence that even when symptoms are recent in onset rotation has been taking place for some time. The symptoms are caused by vascular obstruction, chiefly of the veins, and until this occurs no symptoms, except brief attacks of pain, and no pathological changes in the tumour occur. While, on the one hand, rotation through more than one complete circle may cause no symptoms, "severe nutritional disturbances in the tumour" have occurred with rotation of only 120°.[17] When rotation has been sufficient to interfere with the vascular supply and return of the organ or tumour concerned, acute œdema, congestion, and later necrosis occur. Provided infection is not set up, atrophy follows rotation of solid organs or tumours, but even in these infection may ensue, presumably from the adjacent bowel. Infection is inevitable when the rotated viscus is itself part of the alimentary tract and is more than probable when a cyst, such as an ovarian or fimbrial cyst, is involved. When infection of a solid or cystic body occurs, symptoms of suppuration are added to those of torsion, and when the bowel is involved symptoms of strangulation will also be present. To the slow, gradual type of torsion in which no acute vascular changes occur Bland-Sutton has applied the term "chronic." This has one result which holds out most fascinating possibilities, and that is complete detachment of the organ or tumour concerned. This must be the pathology of the small fibrous or fatty bodies which are occasionally found free in the peritoneal cavity; they may be detached appendices epiploicæ.

The peritoneum surrounding larger tumours, particularly those liable to mild infection, becomes inflamed and adheres to adjacent omentum, bowel, or abdominal wall. Presumably detachment only occurs after a new circulation has been established. Alban Doran[18] records several examples of this process from the practice of Mr. Bantock; one of these specimens, now in the Museum of the Royal College of Surgeons of England, shows a cyst which has acquired a new source of blood-supply from the omentum. Kelly[19] figures a myomatous uterus amputated by torsion and adherent to the anterior abdominal wall.

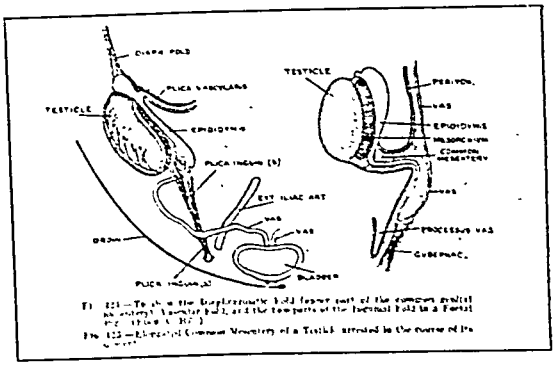
It seems probable that any small degree of chronic rotation must cause pressure on nerve filaments which is represented to the organism as pain. This condition may account for obscure cases of acute fugitive abdominal pains without other symptoms. Cases are on record in which operation carried out solely for abdominal pain has revealed no other pathological condition than a mild degree of axial rotation of the omentum without any vascular disturbance. The day is to be anticipated when a preoperative diagnosis may be arrived at in such cases.

There is some clinical evidence that twisted pedicles may spontaneously untwist. Olshausen[20] found on laparotomy "all the signs of torsion: green discoloration of the cyst wall and of the pedicle, the latter brittle and its vessels thrombosed. The unilocular cyst was filled with blood-stained fluid but the pedicle was not twisted." Grotenfelt[21] has collected 13 cases of a similar kind; in each case the pedicle showed evidence of torsion from the presence of spiral grooves and ridges on its surface.

Rotation in Animals.

Axial rotation of abdominal organs is not infrequent in animals. Volvulus of the small bowel or colon is well recognised in the horse, and axial rotation of the stomach occurs in the dog and of the uterus in several animals, of which the hare is perhaps the commonest. Current books on veterinary surgery and pathology give no help in elucidating the problem in man. Much writing on veterinary pathology is not up to date in relation to human physiology and pathology, and the subject is unlikely to advance until abdominal explorations are as common in veterinary as in human surgery. Axial rotation in animals is attributed without scientific evidence to posture, falls, or overfeeding. Volvulus of the double or small colon, which is the commonest fatal intestinal affection in the horse,[22] is almost always treated by manipulation through the anus, so that the exact condition present is not open to proof. Some are of opinion that

FIG. 10.



From Sir A. Keith's "Human Embryology and Morphology," (London: Arnold, 2nd Ed., 1904.)

physiological experimentation on animals has already yielded the bulk of the knowledge which it has in its power to convey to man, but even if this view be not accepted physiological experiment most urgently needs a corrective in the shape of operative observation under normal conditions. Surgical exploration of animals, beyond the benefit which would be conferred on the animal concerned, is a rich unexplored field for the benefit of mankind which, it is to be hoped, will not elude the vision of the Minister of Health for many years longer.

Rotation of Normal Organs in Man.

Of the normal abdominal organs in man which may undergo rotation the most interesting is the omentum. The factors which induce the purposeful migration of this "abdominal policeman" to different parts of the peritoneal cavity constitute a problem which cannot escape the curiosity of every surgeon, yet, as far as I can discover, no one has supplied a logical answer to it. If, as I think we must, we rely on intestinal peristalsis to supply the motive force both for protective movements and for the pathological twists which occasionally affect the omentum, we are at once embarrassed by the corollary, to which there is no answer: if intestinal movements can produce omental torsion, why is it not frequent? Is it prevented by some natural mechanism or does it require some other pathological condition to act as a "physical adjuvant"? Support is lent to the later

hypothesis by the fact, pointed out by Cowell,[23] that torsion of the omentum usually occurs when a hernia coexists. It has been suggested that the normal rotation of the midgut is in some way assisted by the umbilical ring; can it be that the neck of the hernial sac acts in the same way as a factor in the causation of pathological rotation of the omentum?

Rotation of part of the intestinal tract, as a volvulus of the small intestine, cæcum, or pelvic colon, forms a well-recognised lesion. Dott has shown that one of the important predisposing factors in the production of volvulus of the pelvic colon is a failure of the normal rotation of the midgut. As a result zygosis—a term coined by the late Prof. Shattock to define developmental as opposed to acquired or inflammatory peritoneal adhesion—is defective and the part of the intestinal tract involved remains unduly mobile. It is suggested that adjacent coils of intestine, or an intestinal coil and the uterus, lying one on each side of the pelvic colon, form the required couple and promote rotation by their peristalsis. This seems to me to be the usual nature of all types of intraperitoneal rotation.

Axial rotation of the female pelvic organs has been recognised for nearly a hundred years.[24] Torsion of the uterus is particularly likely to occur in an animal with a bicornuate uterus and is also known in woman, especially in the presence of a fibromyoma of the body of the uterus which, by rising out of the pelvis, elongates and narrows the supravaginal portion of the cervix.[25] Conditions favourable for rotation then exist and the uterus turns to the right. It would seem that the rectum and bladder are the two forces which form the rotating couple. The bladder may play an active or merely a passive part in this process, but I see no reason to doubt that recurring distension and emptying of the bladder may exert an important influence upon rotation of the uterus.

More attention has been paid to axial rotation of pelvic tumours than to all the other forms of torsion. In Sir John Bland-Sutton's opinion rotating tumours tend to turn towards the midline; those on the right turn to the left and left-sided tumours rotate to the right. This rule is not without exceptions, for several gynæcological authorities state that the path of rotation "follows the direction of the movement of supination of the forearm of the affected side."[26] This question is only of interest in that it may give us some clue to the discovery of the factors which bring about rotation. The first important paper on this subject published in this country was by Lawson Tait,[27] who records a post-mortem on a fatal case in which rotation had taken place through four and a half complete revolutions. Any pelvic tumour which has acquired a pedicle of sufficient length and tenuity may become rotated. Cysts in the broad ligament—parovarian or fimbrial cysts—are least often affected, for they are primarily sessile and only rarely acquire long pedicles. The process seems to affect tumours of medium size; possibly very large tumours escape because they have been present long enough to form anchoring adhesions, but a normal ovary or an enormous tumour weighing 20 kg. may be involved. A thin, long, elastic pedicle will offer less resistance to any rotating force, but it will also have less power to straighten itself. On the other hand, its vessels are less likely to be obstructed from a degree of rotation which would obstruct the vessels of a thicker, shorter pedicle. Bland-Sutton and Giles[28] quote Spencer Wells's statement that "axial rotation has been especially noticed to follow the diminution in size of the uterus after delivery at term or abortion." It is difficult to understand how any decrease in intra-abdominal pressure can predispose to torsion. The determining factor seems to be the still forcible uterine contractions which follow labour, the necessary couple being formed by this organ and the sacral promontory.

Widely differing opinions have been expressed as to the forces which promote rotation. Following Goodsir's teaching that a law of spirality guides the wth of all organisms, Fischer[29] maintains that axial torsion is a function of the living cell, that the growth of tissues takes place under constant spiral axial torsion, and that bilateral symmetrical organs rotate to that side opposite to which they belong. This theory has been applied to the growth of ovarian tumours, and is known as "Kustner's law." The acceptance of a principle like this negatives intestinal peristalsis as a cause of rotation, for peristalsis could scarcely produce uniform rotation in one direction. If we can exclude intestinal peristalsis and are dissatisfied with the hypothesis that rotation is a natural phenomenon of growth, we are forced to invoke the aid of the abdominal wall. If rotation of a given organ or tumour were always in one direction it would support the suggestion that the rectus muscle of that side, with the vertebral column, provides the couple, but the frequent rotation of small organs or tumours on which the rectus could scarcely exert any force is an argument against this view. Mayer[30] states that torsion is hindered when the tumour lies in the pelvis and favoured when it is in the abdominal cavity, and suggests that in the pelvis it is less affected by external influences and by intestinal peristalsis.† Freund[31] is of opinion that ovarian tumours lying in the pelvis tend to grow down behind the uterus but later, as they enlarge and become abdominal, tend to fall forwards with their pedicles on their posterior aspects. Much has been written in support of the view that bodily movements induce rotation of abdominal tumours. The principles involved, as Mayer writes, are the transmission to the tumour of a turning movement of the whole body and the property of inertia by which the tumour continues the movement transmitted to it when the body has returned to rest.

Sellheim's findings are in favour of the influence of bodily rotation as a cause of rotation of cystic bodies, but such bodily movements as his theory demands do not occur in ordinary life, and he entirely ignores the fact that rotation takes place most frequently in ovarian fibromata,[32] and is also relatively common in ovarian dermoids. The thick walls and semi-solid contents of these cysts do not fulfil the mechanical conditions demanded by his hypothesis. The hæmodynamic theory of Payr[33] deserves careful consideration; by physical experiment he endeavoured to show that the cause of rotation was the difference in pressure in the veins and arteries of the pedicle respectively. He argued that when the venous circulation was once interfered with the distended vein formed a spiral round the artery, but usually these conditions do not exist in the pedicle of a rotated viscus or tumour, since both artery and vein are twisted. Apart from this, his theory is still far from supplying the real cause of rotation, for it presupposes the existence of venous obstruction, which can only occur when rotation has already begun. In my judgment there is more evidence in favour of an "internal" than of an "external" cause. I find myself unable to accept Kustner's law and see no reason to doubt that intestinal peristalsis, alone or with uterine contractions, provides the components of the couple necessary to promote rotation of pelvic tumours.

SUMMARY.

It has been my object to show (1) that axial rotation has a mechanical basis, (2) that this is founded upon the principle of the couple, (3) that

† The necessary elongation of the pedicle and the fact that when in the abdomen the tumour is more liable to be influenced by intestinal movements undoubtedly favour rotation, but that such a position is not essential is shown by cases such as the following: In 1926 I operated on a woman of 27, five months pregnant, for acute abdominal pain; attacks had recurred for three days and after 24 hours in hospital her pulse began to rise. Per vaginam a defined mass the size of a golfball could be felt in Douglas's pouch, so she was admitted as a case of appendicular abscess. On laparotomy this proved to be an intensely congested right ovary and tube of which the pedicle was twisted through two and a half circles to the left. The parts affected were removed. Owing to the size of the uterus the lower ileum, which usually occupies the pouch of Douglas, had been displaced upwards, and the right half of the pelvis was shown at operation to contain nothing but the uterus and the right tube and ovary.

the couple is provided by two contracting viscera or by one viscus and a resistance such as the sacrum, and (4) that nature has a limiting influence on rotation through the arterial circulation in all pedicles.

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TOBACCO AMBLYOPIA.

BY H. M. TRAQUAIR, M.D., F.R.C.S. EDIN.,

OPHTHALMIC SURGEON TO THE ROYAL INFIRMARY, AND TO CHALMERS' HOSPITAL AND POORHOUSES, EDINBURGH.

THIS paper is based on the records of the ophthalmic department of the Royal Infirmary, Edinburgh, for the years 1913 to 1926 inclusive. The work is conducted in two similar but independent clinics (designated A and B), and Table I. shows the statistics from each clinic, and also those from the two combined.

TABLE I.—*Showing Statistics from Clinics A and B, and the Two Combined.*

	A.	B.	Combined.
Total patients	55,253	52,889	108,142
Tobacco amblyopia cases:			
Total and Percentage ..	458 (0·83)	630 (1·2)	1,088 (1·0)
Year—highest percentage ..	1914 (1·35)	1916 (2·13)	1915 (1·48)
" lowest " ..	1921 (0·21)	1922 (0·5)	1921 (0·41)
Highest month (aver. number of cases)	April (5·0)	June (4·57)	April (9·3)
Lowest month (aver. number of cases)	Oct. (1·6)	Dec. (2·0)	Dec. (3·6)
Highest age	84	79	84
Lowest age	29	23	23
Tobacco consumption—oz. per week:—			
Highest	12	7	12
Lowest	0·5	0·5	0·5
Average	3·43	2·9	3·13
Occupations:—			
Outdoor	—	—	451
Indoor	—	—	600
Not given	—	—	37
Females	1	5	6

The figures illustrate the different experiences which two practically identical clinics may have in the same town, each receiving patients on alternate days of the week. It will be seen that B, which had over 2000 fewer patients, had nearly 200 more cases of tobacco amblyopia. The peak of annual incidence was two years later (1916 v. 1914) in B than in A, and was also higher, attaining the unusual figure of over 2 per cent. in 1916 in B. The lowest annual incidence was about the same time (1921) in both, but lower in A than in B (0·2 v. 0·5). The highest and lowest monthly incidences were two months later in B (June v. April and December v. October). The average age was over ten years higher in B than in A. Five female cases were recorded in B and only one in A. In reality six occurred in B, but notes of one could not be found, and it was therefore not included. The average weekly consumption of tobacco was half an ounce less in B than in A. These discrepancies are of interest in so far as they reflect upon the value of the statistics. Had the figures from one clinic only been available a somewhat less informative picture would have been obtained. It would appear that there are difficulties in assessing accurately the prevalence of this disease. No special features in the two clinics can be adduced as explanatory factors. In B, which had more cases of amblyopia, the staff was constant during the period, and the patients came on Tuesdays, Thursdays, and Saturdays; in A there were several changes in the staff owing to the war and to the natural course of events, and the patients came on Mondays, Wednesdays, and Fridays.

In regard to the combined figures the following points may be noted:—

Percentage of Cases.—The records of other observers show that the numbers of cases of tobacco amblyopia in proportion to the total patients vary considerably in different places. From 0·2 per cent. to 1·4 per cent. have been recorded, and the 1 per cent. for Edinburgh is evidently a fairly high figure.

Consumption of Tobacco.—Nearly all the patients used between 2 and 4 oz. of tobacco weekly. Four cases are recorded as using ½ an oz. and 28 as using 1 oz. Seventy-four used 5 oz. or more, and the highest figure—9 oz.—was reached in only one case. Five cases, four males and one female, were due to cigarette smoking in numbers from 130 to 280 cigarettes weekly. Four cases, two males and two females, took snuff in quantities of from ½ to 1 oz. weekly. Only four of the six female cases were due to pipe smoking.

Usher in 1100 cases had 27 females, while Cossu had only two females in about 600 cases.

Annual Incidence.—During the 14 years from January, 1913, to December, 1926, the annual percentage of tobacco amblyopia, calculated on the total ophthalmic out-patients, varied from 0·41 to 1·48. The curve shows two peaks, one about the years 1914 to 1917 and the other in the year 1924.

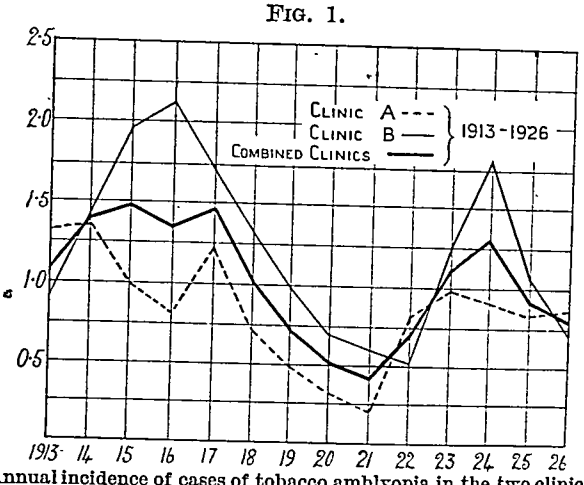
Monthly Incidence.—The monthly incidence, in this case the actual number of tobacco amblyopes, shows a peak in the late spring, the highest month being April and the lowest December. It must be noted that the curve indicates the incidence of application for advice, not the incidence of onset of the amblyopia, which is considerably earlier. As the onset is gradual, patients are usually unable to give more than a vague account of the approximate time when they first noticed visual symptoms. In the presence, however, of a determining factor, such as accident or illness, the date of onset is more definite. The question is discussed by Usher[1] who, after a careful investigation of this point in about 1000 cases, was unable to obtain reliable evidence as to the incidence of onset. In three-quarters of his cases the visual failure began six months or less before advice was sought, and in a quarter of them 12 months or more. The actual monthly incidence of onset must, therefore, be regarded as indefinite at present, nor is it possible to regard a peak in the monthly incidence of amblyopia patients as necessarily indicating a peak in onset in the same or in any other month.

The incidence of cases was found by Cossu[2] to be highest in May and lowest in December, while Usher

found that the majority of patients applied for advice during the summer months. No doubt the bright light is, as Usher suggests, a powerful factor in this connexion, as tobacco amblyopes see badly in bright light, and it is probably the advent of more sunny days which brings them to the clinic.

Age Incidence.—The age incidence corresponds very closely to that found by other observers. The contour

FIG. 1.



Annual incidence of cases of tobacco amblyopia in the two clinics from 1913 to 1926, shown as percentages of the total number of patients at each clinic.

of the plotted ages is rather steeper than that found by Usher and Elderton [1]; there were only 14 patients over 75 and only nine under 30, Usher's corresponding figures being 37 and 23, although 150 fewer cases were included. The peak, as in Usher's statistics, occurred at the 50 to 54 period, which included 199 patients (Usher, 145).

Occupations.—Table II. shows the occupations in 1051 cases. In order to reduce the long list of different

TABLE II.—*Occupations.*

		Per cent.
Labourers, bricklayers, plasterers	138	13
Miners	119	10·3
Agriculturists	73	7·0
Carpenters, joiners, upholsterers, coopers	70	6·6
Mill workers	45	4·0
Railwaymen	43	4·0
Shopkeepers and shop assistants	41	3·9
Metal trades, riveters	91	8·6
Beer and spirits, bar-keepers	53	5·1
Engine drivers, firemen, stokers	43	4·0
Caretakers, janitors	44	4·1
Carters, drivers, chauffeurs	44	4·1
Engineers and mechanics	31	3·0
Painters	22	2·2
Tailors	22	2·2
Clerks	34	3·2
Printers, compositors	19	1·8
Sailors, fishermen	18	1·7
Shoemakers	12	1·1
Papermakers	13	1·2
Miscellaneous	76	7·2
	1051	

pursuits they have been arranged into groups as large as possible, no doubt with the sacrifice of a slight degree of accuracy. A preponderance of about 14 per cent. in favour of indoor occupation was found, but as a large proportion of the industrial population is engaged in indoor work, this does not seem to be enough to indicate that indoor occupation per se especially favours the production of amblyopia. Without accurate information as to the numbers employed in each industry the effects of occupation are difficult to estimate. If we consider the large numbers of miners in the district it is evident that they are probably less prone to tobacco amblyopia than, for example, those employed in the spirit trade or caretakers, although the absolute figures favour the miners. On the whole the figures suggest that sedentary and confined occupations are apt to provide suitable conditions for the development of the disease.

No evidence was found to suggest that exposure to light has any influence in producing the condition. This is in accordance with the findings of Usher. As the macula is the part of the retina which is most exposed to light the disease should begin there if light were a potent factor, but, unfortunately for the light causation hypothesis, this is not the case (Traquair [2]).

In my private practice the proportion of tobacco amblyopia cases has varied round about 0·5 per cent., but is increasing since panel patients have been coming for ophthalmic benefit. The number of cases is too small to enable any conclusions to be drawn, but retired army officers and hotel keepers occupy a prominent position.

Relationship to Alcohol.

Different views prevail as to the extent to which the consumption of alcohol is concerned in the production of what is often called "tobacco-alcohol" amblyopia, or sometimes "alcohol" amblyopia. A few observers hold that the condition is purely alcoholic, others that tobacco is the sole factor, while the majority of ophthalmic surgeons appear to believe that both agents are concerned. On the continent and in America the influence of impure alcohol is widely held to be an important factor, while in Britain many oculists believe that the rôle of alcohol is only secondary in so far as it depresses the health and reduces resisting power. It has also been stated that the moderate use of alcohol renders smokers less liable to develop tobacco amblyopia. Usher and Elderton, in an analysis of 1100 cases, found no evidence to indicate that alcohol was a direct factor in the production of amblyopia. One hundred and twelve of their cases were total abstainers.

The question of the influence of alcohol was thoroughly discussed from the clinical point of view

FIG. 2.

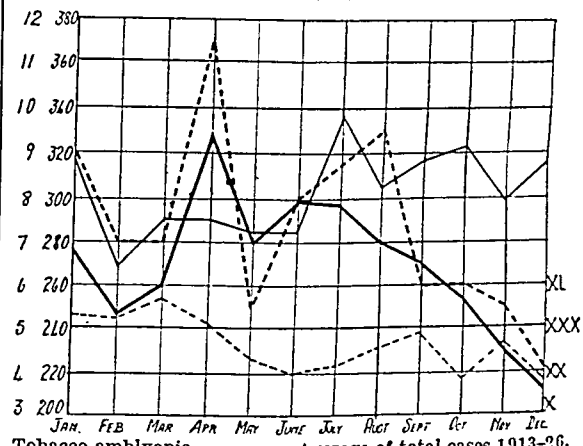


Chart showing monthly incidence of tobacco amblyopia and arrests for drunkenness during the periods 1913–26 and 1923–26. The roman numerals on the right of the chart refer to methylated spirits (m. s.).

by the Ophthalmological Society of the United Kingdom [3] in 1887; yet, in spite of the very definite opinions expressed at that time against the importance of alcohol as a factor, much difference of opinion still seems to prevail. In order to obtain evidence bearing upon this point I have obtained the police statistics of drunkenness in Edinburgh for the years 1913 to 1926, including those of drunkenness due to methylated spirit for the years 1923 to 1926. Although it is readily admitted that statistics of arrests for drunkenness may not indicate correctly the amount of alcoholism of the kind which might be expected to give rise to amblyopia, it seems probable that the arrests for drunkenness will, on the whole, vary in a more or less parallel way with the general alcoholic

consumption in the working-class community, among whom the great majority of cases of tobacco amblyopia arise. It must also be remembered that the figures for drunkenness are derived from Edinburgh, while those for amblyopia include the surrounding district.

On comparing the annual and monthly curves of arrests for drunkenness with those of tobacco amblyopia, it will be seen that the annual incidence for drunkenness due to alcohol declines sharply between the years 1914 and 1918, rises again to 1920, and then gradually falls. The monthly incidence rises, although somewhat unevenly, from February to December, and is low in spring and early summer. The annual incidence for arrests for drunkenness for the years 1913 to 1926 corresponds to the incidence of arrests for all crimes and offences. The drop to 1918 is probably largely if not entirely due to the fact that the potential drunkards and other misdemeanants were nearly all under military control of one kind or another. After 1918 they began to be set free, and arrests for drunkenness and crime began to rise, but tobacco amblyopia continued to fall until 1921—the year of the coal strike. Then tobacco amblyopia began to rise again fairly rapidly, while arrests for all offences and for drunkenness were falling.

FIG. 3.

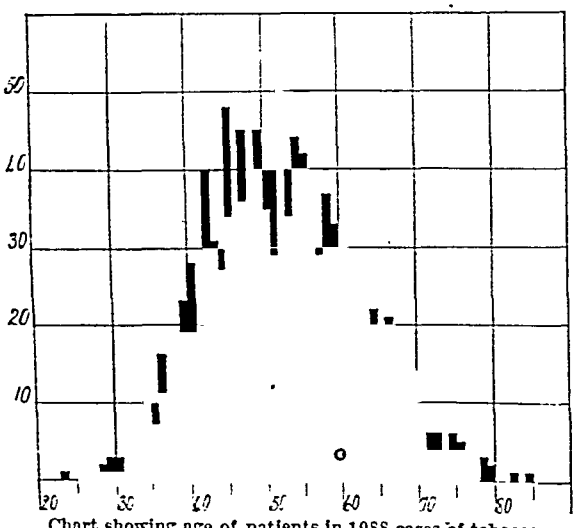


Chart showing age of patients in 1088 cases of tobacco amblyopia.

For methylated spirit, unfortunately, the figures for the last four years only are available. Up to 1923, drunkenness from this cause had been increasing and the police report for that year states that 20 per cent. of drunkenness was estimated to be due to methylated spirit. From 1923 to 1924 the figures show a rapid decline, while amblyopia was rising until 1924. The monthly incidence shows its acme in March but, unlike the incidence of amblyopia, falls during the summer months. If, in order to improve the comparison, the figures for 1923 to 1926 only are used in estimating the monthly incidence of tobacco amblyopia, the graphs still show nothing suggesting any relationship (Fig. 2). Though these figures are based on data which do not in all respects permit of exact comparison, they may be regarded as at least providing no indication of any connexion between drinking and amblyopia. There are other reasons which support this view. The patients suffering from amblyopia belong almost entirely to the respectable working-class, and the kind of individual who may be regarded as a "soaker" or "waster," and who is frequently in the police-court, is seldom found amongst them. These people are met with in the surgical out-patient department and do not appear to suffer from amblyopia; many of them are women, and if drinking had much influence in the production of amblyopia more female cases would surely occur. The high percentage of amblyopia in a respectable, not hard-drinking community, in which wood spirit poisoning is a rare and isolated occurrence, also suggests that alcohol is not a direct factor.

The graphs for tobacco amblyopia and drunkenness show a parallel decline and rise with a three-year interval; whether this has any significance the evidence obtainable does not show. No evidence of any value could be obtained bearing on the state of the public health during the period under consideration, as the insurance statistics are not regional. If such statistics were obtainable it might be of interest to ascertain whether any relationship exists between the general health of a community and the incidence of tobacco amblyopia. The amount of poor relief granted followed the drunkenness curve almost exactly up to 1920, but in 1921 the coal strike confused the issue. The poor relief curve was, no doubt, also influenced by the war.

To summarise: a relationship was found between crime, drunkenness, and poor relief, but none between tobacco amblyopia and any of these factors.

I am informed that *all* (no doubt an exaggeration) french polishers drink methylated spirits and, curiously enough, in the whole 1088 patients there is not a single french polisher.

I have notes of three cases of alcohol poisoning:—

1. Male, age 28, hairdresser, Columbian spirits drunk by mistake. Acute blindness followed by slight recovery with permanent optic atrophy. Royal Infirmary.
2. A man of 40, seen privately; a heavy drinker, who had consumed about a pint a day of methylated spirit for four months. Then, one night, rapid and complete blindness, swelling of optic discs, no recovery, permanent optic atrophy.
3. A man, about 40, seen in poorhouse. Used to be a dispensing chemist and drank methylated spirit. When seen he was almost totally blind and had permanent optic atrophy.

The clinical picture of these cases is totally different from that of tobacco amblyopia, and it appears that large amounts of methylated spirit must be consumed before amblyopia is produced.

FIG. 4.

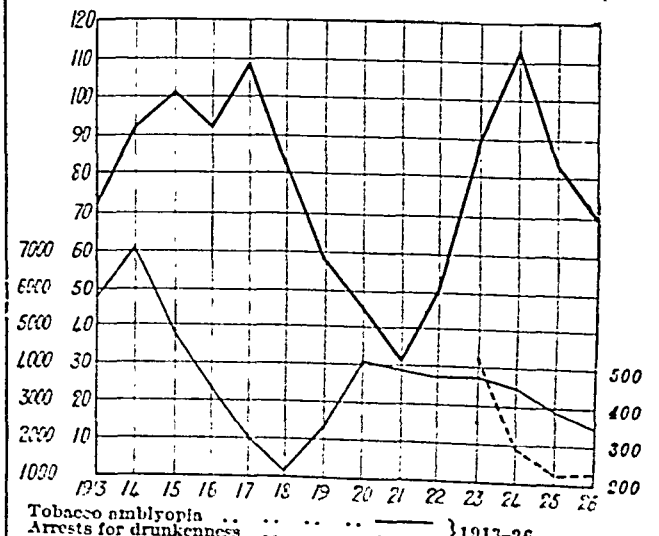


Chart showing total cases per year. The figures on the right (200–500) refer to methylated spirits.

No evidence was elicited to suggest that in the district either an increased incidence or an aggravated form of amblyopia occurred during the war years, an occurrence which might be attributed to the adulteration of alcoholic drinks with impure alcohol containing wood spirit, as was found by Blegvad and Rönne in Denmark. It is evident that the rôle of alcohol

varies according to locality and is dependent not so much on the amount of alcohol consumed as on its purity. In those countries in which impure alcohol is sold and in which wood spirit poisoning is not uncommon, it is to be expected that the consumption of certain alcoholic drinks will be an important factor in the amount or the character of toxic amblyopia. In Britain, and certainly in the Edinburgh area, the amount of wood spirit is minimal, and the part played by alcohol may also be regarded as minimal—that is to say, we have here to deal with a pure tobacco amblyopia.

Clinical Features.

The symptoms described by the patient, together with his history, appearance, and circumstances, build up an extremely characteristic picture. Among the initial symptoms three are more or less prominent. Perhaps the most common is a complaint of "misty" vision; the patient states that he cannot recognise the faces of his friends. In other cases difficulty in reading is the first symptom noticed. This appears to be not quite so frequent an initial symptom as the misty vision; no doubt a good deal depends upon the reading habits of the patient and upon the state of his distant vision under normal circumstances. A third initial symptom is "dazzling" in sunlight. What precisely is meant by "dazzling" is difficult to define accurately. I incline to think that it means that when the pupil is contracted in sunlight the patient seems to see a bright silvery fog between him and objects.

Difficulty in connexion with work is rarely complained of unless the work is of a kind that requires good vision—e.g. the compositor does not see his type properly, and the carpenter does not see his rule. The high degree of amblyopia from this cause which is compatible with labouring work, or even with the work of a gardener, is often surprising.

The character of the visual loss is shown by the patient's hesitation and the mistakes he makes when reading Snellen's test types. He has difficulty in reading the letters which are towards his temporal side. It is also well brought out by a simple test of the light-difference sense, as by Bjerrum's types, which are grey on grey. The tobacco amblyope who can read the ordinary Snellen's card fairly well can see none, or only one or two, of the letters of the Bjerrum's type. Very often there is also a disproportion between the distant vision by Snellens type and the reading vision, the latter being considerably worse than the former would suggest. Indistinct or soiled print is read with unduly great difficulty.

The visual loss has nearly always been present for some time before the patient seeks advice. When he does so, both eyes, in my experience, are always affected, though the defect may be very slight in one. Evidently the disease often begins unilaterally, although this stage does not come under observation.

Many tobacco amblyopes exhibit a striking absence of anxiety about their vision, which makes it difficult to get them to return for re-examination and makes them reluctant to stop their tobacco. Only in the more severe cases does the patient appear to be at all disturbed about his sight. I have persuaded some of these patients—often with some difficulty—to let me examine them again and have found them still smoking, but seeing well enough to do their work and enjoy themselves. Cases of Leber's disease and other forms of bilateral visual failure manifest quite a different attitude. It would appear that a degree of tolerance can be established and that the disease does not progress to the same extent in all cases, even though the use of tobacco is continued. The course of some cases even suggests that spontaneous improvement may occur, with little or no diminution in tobacco consumption, a feature which is probably due to improvement in the patient's general health and resisting power. No case ever progresses to complete blindness.

A very common statement, so common as to be not without value in diagnosis, is that the amount of tobacco used was reduced some weeks before advice was sought, and nevertheless the vision became worse. Also, when the patient after the first consultation has stopped tobacco entirely, the visual defect is not infrequently found to be no better, or even worse, at the second visit six or eight weeks later. This indicates that the poison takes some time to produce its effect and suggests that it is cumulative in its action. It also shows the necessity of making careful inquiries, as the patient tends to state the amount of tobacco he is using at the time of his consultation. In one case, for example, a patient who had both chewed and smoked heavily only developed the amblyopia seven months after reducing his consumption to 2 oz. weekly.

The general health is of great importance. Tobacco amblyopia appears at about that period in life when the physical powers are failing, and in many cases it is possible to obtain a history of some illness preceding the visual defect. This is a factor which probably influences the early summer incidence of the disease, as illness is more common in the winter and early spring. In patients whose systems are saturated by years of tobacco consumption up to, or nearly up to, the limit of their individual tolerance—a limit which is declining as the years advance—a determining factor may easily arise. This factor may be an illness, an accident, or merely a psychical disturbance. One of my private patients missed his footing on attempting to board a moving tramcar and fell; though only a little shaken, he promptly developed amblyopia. An important condition is arterio-sclerosis. Smokers whose health is gradually becoming impaired from this cause are liable to become amblyopic, and this is, I believe, the explanation of the presence, often observed, of hæmorrhages in the retina of tobacco amblyopes. I have seen tobacco amblyopia in tabes and in diabetes, and in the cases which came under my notice I have regarded the general disease as the determining factor. Though always on the look-out, I have not yet seen a scotoma in diabetes or in tabes which was the direct result of either of these diseases. That a high degree of idiosyncrasy exists in different subjects is well recognised, but some additional determining factor will often be discovered when the tobacco consumption is low.

The characters of the field defects have been frequently described, but appear still to be incompletely realised. Although the true incidence of the disease upon the visual nerve elements was demonstrated many years ago (Bär,[6] Groenouw,[7] and Nelson[8]), the macular fibres or cells are still often regarded as those primarily concerned. This misconception has led in the past to unjustifiable theories of causation and still produces much confusion of thought both in diagnosis and ætiology. It cannot be too strongly emphasised that the macular elements, whether cells or fibres, are never either the first or the most severely affected, but are always involved after other elements of the papillo-macular bundle. If the scotoma in a case of moderate severity is carefully examined, the densest areas will be found near the blind spot or between it and the fixation area, not at the fixation area itself. Only when the diffuse margin of the scotoma begins to invade the fixation area does the patient complain of symptoms, and indeed the scotoma may have existed and cleared up without the fixation area itself ever having been perceptibly affected. The scotoma of tobacco amblyopia is therefore not a central scotoma in the true sense, but a temporo-cæcal defect which, by extending over the fixation area, becomes a centrocæcal scotoma.

Diagnosis.

As a rule the diagnosis presents no difficulty. In apparently unilateral cases great care is required in the examination of the apparently unaffected eye, and Bjerrum's screen and small test objects are necessary. There may be no defect of central vision by Snellen's test types.

The only conditions which may possibly give rise to confusion are bilateral affections of the optic nerves. Of these only a few cases among males fit the general clinical picture sufficiently closely to give rise to any doubt. In actual experience I have found that cases of chiasmal interference due to pituitary disease or other causes, and cases of scotoma due to Leber's disease or similar in type, are those which most commonly give rise to uncertainty. The chiasmal group is distinguished by the quadrantic nature of the scotoma and by the presence of other characteristic field changes. Cases belonging to this group are much better understood now, and are therefore more readily recognised than they were a few years ago, so that this cause of difficulty is disappearing. The Leber group gives more trouble, especially those cases which occur about the age of 40, and, while conforming otherwise to the Leber type, present no disc changes or suggestive family history. I have always found the scotoma in these cases to be more dense and more defined than that of tobacco, while the field changes immediately around the scotoma are different. It is no doubt this class of case which has given rise to the statement that toxic amblyopia exactly like that of tobacco may occur in patients who have never used tobacco or alcohol. Personally, I have never seen such a case, nor have I ever read a report of a case of this kind in which the field changes and the clinical picture were described in a sufficiently detailed way to enable a proper comparison to be made with those of tobacco amblyopia. If, in addition to the field changes, the clinical picture as a whole is considered, cases in which a real diagnostic difficulty arises must be extremely rare. These are mostly among patients with large and dense scotomata.

Prognosis.

The prognosis is good except in advanced and severe cases with pallor of the discs, more especially in patients of enfeebled physical condition. In some of these permanent impairment of central vision remains, so that distant vision is reduced to 2/60 or 3/60 and reading to the slow deciphering of large print. Progress may be slow and hope should not be given up until several years have elapsed without improvement. For example:—

1914 v. = Fingers at 2 m.
1915 v. = 6/60.
1917 v. = 6/24 stationary.

Cases in which serious visual incapacity remains appear to be rare in relation to the frequency of the disease.

Lastly, the economic aspect of tobacco amblyopia merits some consideration. From the clinician's point of view it is evident that in many directions inefficiency, loss, and waste of money and time are produced. Is the subject of any interest to the insurance societies or to the Ministry of Health?

I have to thank Dr. J. V. Paterson and Dr. A. H. H. Sinclair for allowing me to use their records.

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A PNEUMATIC BONE OPERATING SET.

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BONE surgery approaches more nearly to pure carpentry than any other branch of the art, and success depends to a greater extent upon accurate operative detail. Many of its more recent developments have been made possible by the introduction of engineering tools, which not only eliminate much hard manual work, but allow a higher degree of perfection and accuracy in performance. Arbuthnot Lane brought into common use many of the tools of the carpenter, and Albee followed with the electrically driven bone operative set, an instrument which made possible many advances in bone surgery, but which has several disadvantages. It is expensive in first cost and in repairs. A supply of electric current is essential, and even where electricity is available, the voltage may be unsuitable, and a variable resistance must be carried. It is cumbersome, and sterilisation is unsatisfactory; the shell must be slipped over an unsterile motor, and the leads have to be draped in towels. It has to work at high speed, and consequently generates much heat at the cutting edge. It cannot be applied in many cases where mechanical aid is most needed—e.g., in a deep wound, or when obliterating and rounding off the dense-walled cavities in a chronically infected bone.

The difficulties encountered in operating on an old-standing abscess in the shaft of a long bone, enclosed in a wall of ivory consistence, led me in 1925 to consider the possibility of applying to bone surgery the principle of the pneumatic hammer which is in everyday use in road-breaking, and thus utilising a source of power which is available in every hospital in the form of cylinders of compressed nitrous oxide or oxygen. I was fortunate, through the help of Mr. J. M. Hulett, a student at Guy's Hospital, in finding an engineer who was willing to carry out the experimental work and design an apparatus suitable to surgery. After some experiments the Boyer hammer was adapted for use with surgical instruments, and has proved eminently satisfactory at Guy's Hospital since March, 1927. I hesitated at the time to place the instrument before surgeons because its applications were restricted. A mechanical bone operative set should be able to do everything that may be required in the surgery of the skeleton, and to do it better than it can be done by hand. During the past year detailed improvements to the original hammer and the addition of a pneumatic drill have so far increased the field of usefulness of the pneumatic apparatus that it now claims to satisfy these requirements.

The Supply of Pneumatic Pressure.

Pneumatic tools in industry are supplied with air under pressure by a motor-driven compressing plant. Such a plant could easily be installed in a hospital, but the apparatus could then only be used in one theatre, and the compressed air would contain all the bacteria of room air. Cylinders of compressed air, as supplied by the British Oxygen Co., provide the best source of pneumatic pressure for a surgical instrument. The air in these cylinders is sterile; it is also free from moisture, and is therefore more suitable for use in finely adjusted machinery than compressed atmospheric air. The cylinders most commonly used contain 40 and 100 cubic feet of air at 120 lb. pressure, and cost 4s. per 100 cubic feet to renew. Either can be carried in a car, and suffices for several ordinary operations. Larger cylinders can be obtained for hospital use. Although no explosion has yet occurred with oxygen when liquid paraffin has been used for lubrication, the margin of safety is probably a small one, and cylinders of compressed oxygen should therefore be avoided; in an emergency nitrous oxide could be safely used.

varies according to locality and is dependent not so much on the amount of alcohol consumed as on its purity. In those countries in which impure alcohol is sold and in which wood spirit poisoning is not uncommon, it is to be expected that the consumption of certain alcoholic drinks will be an important factor in the amount or the character of toxic amblyopia. In Britain, and certainly in the Edinburgh area, the amount of wood spirit is minimal, and the part played by alcohol may also be regarded as minimal—that is to say, we have here to deal with a pure tobacco amblyopia.

Clinical Features.

The symptoms described by the patient, together with his history, appearance, and circumstances, build up an extremely characteristic picture. Among the initial symptoms three are more or less prominent. Perhaps the most common is a complaint of "misty" vision; the patient states that he cannot recognise the faces of his friends. In other cases difficulty in reading is the first symptom noticed. This appears to be not quite so frequent an initial symptom as the misty vision; no doubt a good deal depends upon the reading habits of the patient and upon the state of his distant vision under normal circumstances. A third initial symptom is "dazzling" in sunlight. What precisely is meant by "dazzling" is difficult to define accurately. I incline to think that it means that when the pupil is contracted in sunlight the patient seems to see a bright silvery fog between him and objects.

Difficulty in connexion with work is rarely complained of unless the work is of a kind that requires good vision—e.g. the compositor does not see his type properly, and the carpenter does not see his rule. The high degree of amblyopia from this cause which is compatible with labouring work, or even with the work of a gardener, is often surprising.

The character of the visual loss is shown by the patient's hesitation and the mistakes he makes when reading Snellen's test types. He has difficulty in reading the letters which are towards his temporal side. It is also well brought out by a simple test of the light-difference sense, as by Bjerrum's types, which are grey on grey. The tobacco amblyope who can read the ordinary Snellen's card fairly well can see none, or only one or two, of the letters of the Bjerrum's type. Very often there is also a disproportion between the distant vision by Snellens type and the reading vision, the latter being considerably worse than the former would suggest. Indistinct or soiled print is read with unduly great difficulty.

The visual loss has nearly always been present for some time before the patient seeks advice. When he does so, both eyes, in my experience, are always affected, though the defect may be very slight in one. Evidently the disease often begins unilaterally, although this stage does not come under observation.

Many tobacco amblyopes exhibit a striking absence of anxiety about their vision, which makes it difficult to get them to return for re-examination and makes them reluctant to stop their tobacco. Only in the more severe cases does the patient appear to be at all disturbed about his sight. I have persuaded some of these patients—often with some difficulty—to let me examine them again and have found them still smoking, but seeing well enough to do their work and enjoy themselves. Cases of Leber's disease and other forms of bilateral visual failure manifest quite a different attitude. It would appear that a degree of tolerance can be established and that the disease does not progress to the same extent in all cases, even though the use of tobacco is continued. The course of some cases even suggests that spontaneous improvement may occur, with little or no diminution in tobacco consumption, a feature which is probably due to improvement in the patient's general health and resisting power. No case ever progresses to complete blindness.

A very common statement, so common as to be not without value in diagnosis, is that the amount of tobacco used was reduced some weeks before advice was sought, and nevertheless the vision became worse. Also, when the patient after the first consultation has stopped tobacco entirely, the visual defect is not infrequently found to be no better, or even worse, at the second visit six or eight weeks later. This indicates that the poison takes some time to produce its effect and suggests that it is cumulative in its action. It also shows the necessity of making careful inquiries, as the patient tends to state the amount of tobacco he is using at the time of his consultation. In one case, for example, a patient who had both chewed and smoked heavily only developed the amblyopia seven months after reducing his consumption to 2 oz. weekly.

The general health is of great importance. Tobacco amblyopia appears at about that period in life when the physical powers are failing, and in many cases it is possible to obtain a history of some illness preceding the visual defect. This is a factor which probably influences the early summer incidence of the disease, as illness is more common in the winter and early spring. In patients whose systems are saturated by years of tobacco consumption up to, or nearly up to, the limit of their individual tolerance—a limit which is declining as the years advance—a determining factor may easily arise. This factor may be an illness, an accident, or merely a psychical disturbance. One of my private patients missed his footing on attempting to board a moving tramcar and fell; though only a little shaken, he promptly developed amblyopia. An important condition is arterio-sclerosis. Smokers whose health is gradually becoming impaired from this cause are liable to become amblyopic, and this is, I believe, the explanation of the presence, often observed, of hæmorrhages in the retina of tobacco amblyopes. I have seen tobacco amblyopia in tabes and in diabetes, and in the cases which came under my notice I have regarded the general disease as the determining factor. Though always on the look-out, I have not yet seen a scotoma in diabetes or in tabes which was the direct result of either of these diseases. That a high degree of idiosyncrasy exists in different subjects is well recognised, but some additional determining factor will often be discovered when the tobacco consumption is low.

The characters of the field defects have been frequently described, but appear still to be incompletely realised. Although the true incidence of the disease upon the visual nerve elements was demonstrated many years ago (Bär,[6] Groenouw,[7] and Nelson[8]), the macular fibres or cells are still often regarded as those primarily concerned. This misconception has led in the past to unjustifiable theories of causation and still produces much confusion of thought both in diagnosis and ætiology. It cannot be too strongly emphasised that the macular elements, whether cells or fibres, are never either the first or the most severely affected, but are always involved after other elements of the *papillo-macular* bundle. If the scotoma in a case of moderate severity is carefully examined, the densest areas will be found near the blind spot or between it and the fixation area, not at the fixation area itself. Only when the diffuse margin of the scotoma begins to invade the fixation area does the patient complain of symptoms, and indeed the scotoma may have existed and cleared up without the fixation area itself ever having been perceptibly affected. The scotoma of tobacco amblyopia is therefore not a central scotoma in the true sense, but a temporo-cæcal defect which, by extending over the fixation area, becomes a centrocæcal scotoma.

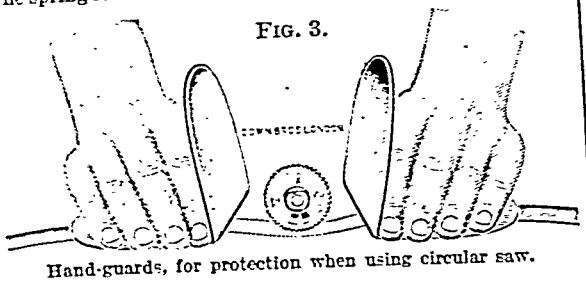
Diagnosis.

As a rule the diagnosis presents no difficulty. In apparently unilateral cases great care is required in the examination of the apparently unaffected eye, and Bjerrum's screen and small test objects are necessary. There may be no defect of central vision by Snellen's test types.

instrument with a rotary action to be fitted, whatever the shape of its shank. The control of speed which is possible in the pneumatic drill has proved of great benefit. There is no tendency for drills to jump when first applied to bone, for they are pressed against it at a slow speed of rotation, and the plunger is fully depressed only when the point of the tool has entered the bone.

Two new instruments have been made for the apparatus, a screw-holding driver and a hand-guard, for use with the saw in cranial surgery. The screw-driver works inside a hollow cylinder, which terminates in a cone-shaped collar (Fig. 2 c). When this cylinder is pressed down, the head of any size of bone screw can be slipped into position in the cone through a lateral slot, and, when pressure is released, it is held firmly against the screw-driver by the pressure of a spring. As soon as the screw has been driven in it is released by tilting the driver sideways, making the head come out through the slot. The spring retracts the collar, allowing the blade of the screw-

FIG. 3.



Hand-guards, for protection when using circular saw.

driver to project, and the screw is driven home. With this tool a large number of screws can be inserted in a very short time.

The hand-guards are used in fashioning osteoplastic cranial flaps. Surgeons have hitherto been afraid to use a motor-driven circular saw for this purpose because of the danger of tearing the dura and of wounding the scalp flap or the hands of the assistant, should the saw jump the bone. The nicety of control which is allowed by the light weight of the pneumatic drill and the exactness with which its speed can be regulated do away with these dangers. To fashion an osteoplastic flap, drill-holes are first made down to the dura with the Hudson burr, outlining the proposed flap. A dura mater protector of thin spring steel is then worked from one hole to the next between the dura and the bone. The hand-guards are slipped over the projecting ends of the protector, and an assistant, grasping the knobs of these guards, steadies the patient's head and holds the protector in position, while a bevelled cut is made with the circular saw from one hole to the next (Fig. 3). By this means an osteoplastic flap of any shape and dimensions can be rapidly cut without any risk of damage to underlying membranes.

Notes on the Use of the Pneumatic Operative Set.

The pneumatic operative set is universally applicable to bone surgery, inexpensive, and thoroughly reliable. The motive power for its use can be found everywhere where surgery is possible. Both tools are sturdy and simple, and can be sterilised by heat. The efficiency of an instrument actuated by gas pressure depends upon the smooth working of parts which are a gas-tight fit and which will be impaired by distortion or rust; therefore excessive heat or boiling must be avoided. Dry heat or immersion in lysol are the best means of sterilisation. The air in the cylinders is sterile, but after passing through the pressure gauge may contain a very small number of organisms; these can be removed by inserting a small metal chamber containing glass wool between the gauge and the tubing which leads to the instrument (Fig. 1 c). Before use a few drops of sterile liquid paraffin should be put into the air inlet and blown through by air pressure.

The hammer is operated by placing the chisel in firm contact with the bone, so that the piston is pushed to the top of its working stroke, and then depressing the air valve in the handle; air should not be admitted until the chisel is actually pressing on the bone. As soon as the cut is finished the valve should be released. The efficiency of cutting is only maintained if the hammer returns freely after each blow, and ceases if the chisel jams. Therefore the tool should not be driven deeply into the bone, but nearly parallel to its surface. In this way shavings of bone 2 or 3 millimetres in thickness can be removed with great rapidity and under perfect control. The hammer and the tools it works are of great service in operations for acute or chronic osteomyelitis, in cutting large and uniform osteoperiosteal grafts, in cuneiform osteotomy, and in the operations of arthrodesis and arthroplasty. The small rapid blows of the instrument drive the tool steadily through dense bone with the precision of a sharp instrument cutting soft tissues. There is no danger of driving the edge too far, as may occur with the single powerful blows delivered by a hand mallet. The cut surface is smooth and regular; thus the reshaping of an articular end in arthroplasty can be done in a way that is impossible with hand work. The hammer consumes much more air than the chisel, and some escapes even when it is idle; it is therefore advisable to close the valve of the cylinder when it is not in use.

The drill is extremely economical in air consumption, and there is no appreciable leakage, so that the cylinder may be left turned on during intervals in the work. The barrel of the tool may be grasped in the hand, like the handle of a tennis racket, and the control valve regulated by pressure of the hypothenar eminence. For drilling it may be held vertically and the valve worked by the index finger. It should be remembered that morse drills are designed to cut their own channel, and will work most efficiently if allowed to do so; additional pressure may lead to jamming in the bone.

In bone-grafting, cranial surgery, and in the operative treatment of fractures this tool lightens labour and produces better work than those operated by hand.

The pneumatic operative bone set was shown before the Orthopædic Section of the Royal Society of Medicine in December, 1927, and before the Association of Surgeons in May, 1928. It is made by Down Bros., St. Thomas's-street, London, S.E. 1.

ON THE STANDARDISATION OF THE FEMALE SEXUAL HORMONE.

ESPECIALLY OF PURE WATER-SOLUBLE PREPARATIONS (MENFORMON).*

BY PROF. ERNST LAQUEUR, M.D.,

AND

S. E. DE JONGH, M.D.

(From the Pharmacotherapeutical Laboratory, University of Amsterdam.)

THE increasing importance of the standardisation of the female sexual hormone from the pharmacological as well as from the clinical point of view, together with the appearance in commerce of several preparations with different activities, expressed in so-called "units," made it seem desirable to define the unit as exactly as possible and to establish a method by which it could be determined. The method, of course, must be based upon the well-known fact, first used for the purpose by Allen, Doisy, and others, that material containing this hormone is able to reproduce œstrus in castrated female rats and mice, as seen microscopically in stained vaginal smears. Their provisional definition: that *a unit be the smallest amount of substance capable of producing œstrus in a castrated rat or mouse*, needs amplification in various directions. It should mention which microscopic picture is to be taken as the limit reaction; how many animals at least should be used for every standardisation, and how many of these at least should show the limit reaction; and the method by which the substance is brought into the animal body. From our extensive experience (standardisation of about 8000 batches, more than 250,000 smears) we thought

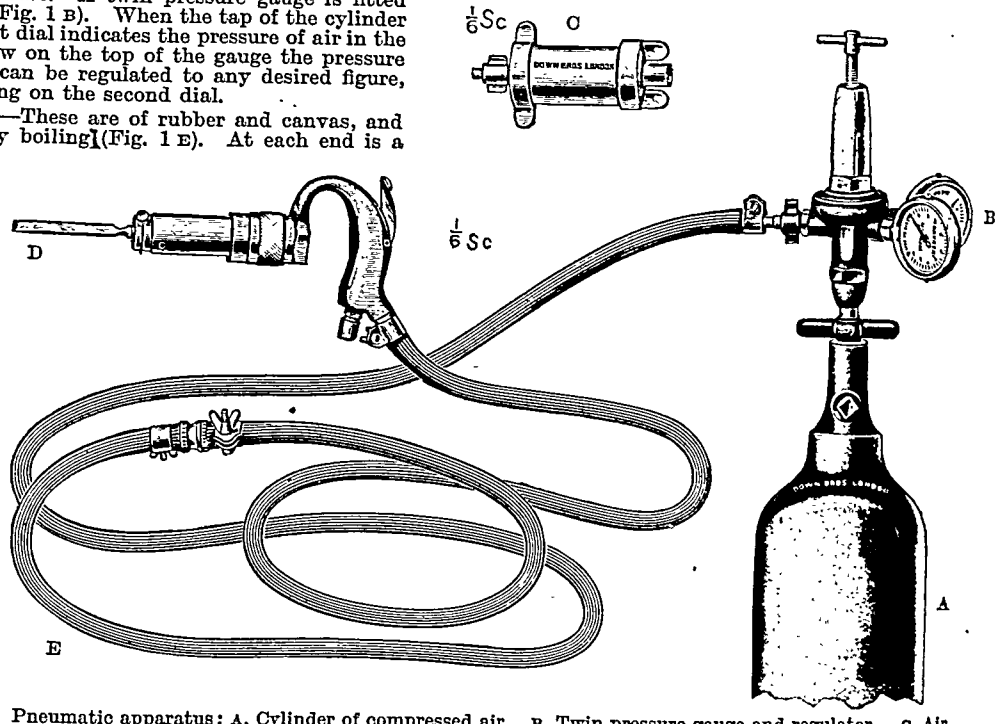
* Abstracted from a paper appearing in the Journal of Pharmacology and Experimental Therapeutics.

Description of the Apparatus.

Regulation of Pressure.—A twin pressure gauge is fitted to the gas cylinder (Fig. 1 B). When the tap of the cylinder is turned on the first dial indicates the pressure of air in the cylinder. By a screw on the top of the gauge the pressure of the escaping air can be regulated to any desired figure, the amount appearing on the second dial.

Connecting Tubes.—These are of rubber and canvas, and may be sterilised by boiling (Fig. 1 E). At each end is a gas-tight coupling, connected by a half-turn. The male end of each connexion carries a valve, which is only opened by pressure of the female end against a central pin. Thus it is possible to disconnect the tubing and to change from one instrument to another without shutting off the supply of air at the cylinder. One end of this tubing is attached by the surgeon to the instrument; the other is fixed by an assistant to the connexion on the cylinder.

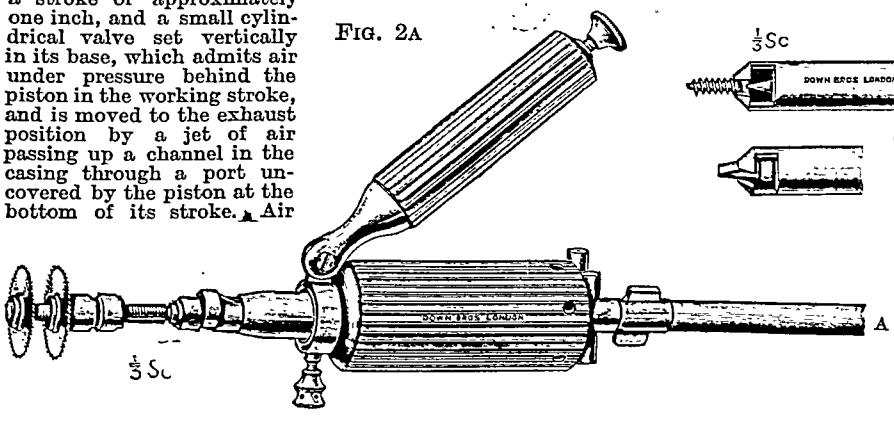
FIG. 1.



Pneumatic apparatus: A, Cylinder of compressed air. B, Twin pressure gauge and regulator. C, Air filter. D, Pneumatic hammer, with osteotome. E, Tubing and connexions.

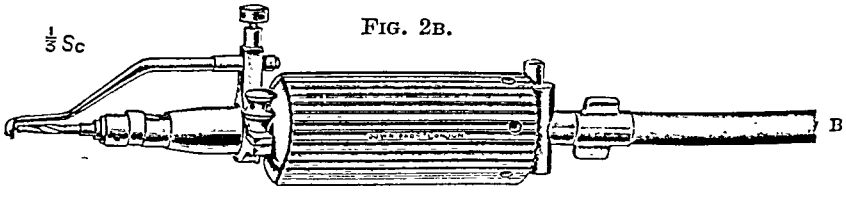
The Hammer.—This is the Boyer F. hammer with pistol grip, which has been polished and plated externally to give it an aseptic finish, and has been modified in certain details to adapt it for surgical work (Fig. 1 D). The essential working parts are a heavy piston, which forms the hammer, travelling up and down in the barrel of the tool with a stroke of approximately one inch, and a small cylindrical valve set vertically in its base, which admits air under pressure behind the piston in the working stroke, and is moved to the exhaust position by a jet of air passing up a channel in the casing through a port uncovered by the piston at the bottom of its stroke. Air is admitted to the hammer by pressure of the thumb on a lever in its handle. By a screw adjustment at the bottom of the handle the strength of blow can be varied from a gentle tap, suitable for mastoid work, to full force. The hammer has been fitted with a collar to take the tools.

FIG. 2A



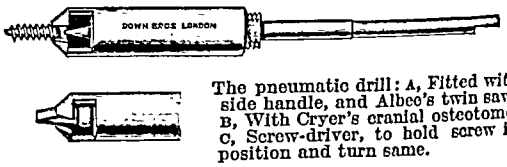
The tools have a cylindrical shank, in which a slot is cut, fitting into the collar in the hammer. Into this slot is slipped a pin, which passes through a hole in the collar, and is held in position by a spring catch. The pin allows the tool to travel up and down for the length of the slot, but prevents it being driven out by the force of the blow; the slot determines the length of travel and prevents rotation of the tool on its axis. Four different positions of the pin in the collar allow the cutting edge of the tool to be set at four different angles to the handle. The tools which have been found most useful are gouges and chisels of the Albee type, and a small mastoid gouge.

FIG. 2B.



The Drill.—The drill is an adaptation of the Desoutter pneumatic drill, which is manufactured for small work in machine shops (Fig. 2). It consists essentially of a block of five small cylinders, disposed round a central axis, the pistons acting directly on a double spiral cam, which is fixed to the spindle carrying the chuck for the tools. For surgical work the drill has been fitted with an Albee chuck to take the saws and drills which are used with the electrical instrument. The air inlet has been made to fit the quick connexion of the tubing, leather washers have been replaced by asbestos, and the instrument is enclosed in a fluted casing which gives a comfortable grip and is easily cleaned. The drill weighs less than two pounds and lies comfortably in the hollow of the hand. The torque is very smooth and quite free from vibration, and the speed of rotation can be adjusted, from zero to 2400 revolutions per minute, by regulation of the amount of air admitted. The air is controlled by a plunger depressed by a spring button. All the parts are of sturdy construction, and there is nothing to wear out.

FIG. 2C.



The pneumatic drill: A, Fitted with side handle, and Albee's twin saw. B, With Cryer's cranial osteotome. C, Screw-driver, to hold screw in position and turn same.

All the tools commonly used with the electric motor can be used with the pneumatic drill. A universal chuck, which may be coupled to the Albee chuck, allows any

the results obtained in various countries agree very closely (America, England, Germany, Holland, Latvia), so that the need for an international standard preparation seems less than in the case of, say, insulin. Solutions ready for use are preferable; they should contain one mouse unit in 0·3 c.cm. of oil or 0·6 c.cm. of water, in ampoules of 5 and 10 c.cm., so that six to ten animals can always be injected simultaneously. We shall be glad to send such standard solutions to any colleague who applies. It would be possible with these solutions to ascertain whether the sensitiveness of the animals is really the same in all countries. For that purpose several series, of six or even twelve animals each, should be injected with 1 unit per animal on different days. When 30 or 60 animals had been tested in this way, the results should be calculated, to see whether they agreed with the 75 per cent. of positive results required by the definition. If 1 unit of the standard preparation yields constantly consistently higher or lower percentages, we should be grateful if the investigator would communicate with us. It is in these cases that the value of a standard preparation would be obvious. For, given exactness in standardisation, it seems superfluous to require injection of the standard side by side with the substance to be tested at every standardisation, as is indispensable, for instance, with insulin. It is sufficient to adhere to the definition given above: *1 unit is the smallest amount of a solution that under the precautions mentioned* (adequate fractionation, sufficient number of observations, &c.) *produces positive smears* (as defined above) *in 75 per cent. of well-castrated animals.* "Well"-castrated animals are those that on daily control during at least four weeks do not show any smear containing more than about 30 per cent. of epithelial cells. Two sets of six such animals each should be injected on different days, after the probable strength has been estimated from a few preliminary experiments upon three animals each. The amount of liquid injected should contain 1 unit and no more than ten animals should become positive. A lower limit of eight is only to be accepted if at least two out of the four "non-positive" animals show a recognisable effect. Oily solutions should be injected on the morning and evening of the first day and in the morning of the second; aqueous solutions are injected morning and evening of the first day, morning, noon, and evening of the second, and in the morning of the third. Smears should be stained by the "Giemsa" method.

Summary.

The method of standardisation of the female sexual hormone outlined by Allen, Doisy, and others has been developed with the help of experimental data gained by very extensive experience. Definite directions are given and a standard preparation is put at the disposal of other workers in the same field.

Clinical and Laboratory Notes.

NOTE ON THE IMPORTANCE OF SLEEP IN THE TREATMENT OF ACUTE DISEASE.

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AMID the constant rush of new theories and the unceasing claims of novel methods of healing some of the essentials of successful treatment may easily be overlooked, and this must be my excuse for a short note on the importance of securing adequate sleep in the treatment of disease and particularly of acute illness. Let me give an example from one of the most familiar of diseases—acute bronchitis.

A woman of 65 had been ill for about twelve days with increasing bronchitis, which had got much worse during the previous 24 hours. I saw her with Dr. J. I. Shepherd, of Friern Barnet. Her temperature was about 100° F., pulse 115, respirations 36, with orthopnœa, working of the alæ nasi, and much inspiratory recession of the soft parts of the chest wall. Expectoration had gradually been diminishing and had now almost ceased, but abundant, large and small, moist, non-consonating adventitious sounds were heard all over the lungs, especially at the left base. It seemed very doubtful whether she would live another 24 hours. She was treated with stimulant expectorants, vigorous counter-irritation to the chest, both front and back, and inhalations of oxygen at frequent intervals.

Two days later I saw her again, rather to my surprise, for I had not expected she would live so long. She had just held her own, but her colour was bad, sputum still very scanty, and she was obviously becoming exhausted; she said she felt worn out, for she had had only short snatches of unrefreshing sleep. The situation appeared well nigh hopeless, left as she was it seemed practically certain that after another night of constant, ineffective cough, heart failure would inevitably follow; on the other hand, it seemed equally certain that if she were given any drug sufficiently powerful to compel reasonably sound sleep, the secretion in her bronchial tubes would accumulate and cause fatal asphyxia.

With much hesitation we gave her by the mouth a tablet containing a grain of morphia and one-hundredth of atropine. She slept fairly soundly for several hours, but during that time her colour became worse and her respirations more shallow. She was kept alive by oxygen given through a tube passed directly into the nostril, which fortunately did not interfere with her sleep. When she awoke she felt distinctly better, and began to cough more effectively. Her condition remained critical for some days longer, and the dose of morphia and atropine had to be repeated one night, but improvement, though very slow at first, was fairly continuous; she began to expectorate increasing quantities of thick, purulent sputum, and eventually made a satisfactory recovery.

A Traditional Rule Broken.

Had we not broken one of the traditional rules of medicine by giving morphia to an elderly patient with advanced general bronchitis, I believe she would inevitably have succumbed. The rule is undoubtedly excellent, but, like all others in medicine, must not be adhered to blindly, although in such desperate cases the doctor is very likely to feel that as the patient will probably die anyhow, it is better that the end should be brought about by the disease rather than by the remedies. The risk in the case described was certainly great, but less I believe than that of another sleepless, exhausting night. The morphia was given by the mouth because it seemed likely that its action, whilst equally effective, would be more gradual and therefore safer than if it were administered hypodermically. The atropine is presumably useful by diminishing the amount of secretion in the bronchial tubes and so the imminent danger of asphyxia.

In many forms of heart disease morphia as a narcotic is still more generally helpful, without the danger necessarily attendant upon its altogether exceptional use in severe cases of bronchitis. Its value in advanced cases of aortic disease, in which the patient as soon as he drops off to sleep is disturbed by sudden dyspnœa, is generally recognised. More hesitation is often felt in giving it to patients suffering from mitral disease, with a failing, irregular heart, and general œdema. The lungs are more or less waterlogged, there is probably some albuminuria, and it is naturally feared that morphia may lead to a dangerous accumulation of secretion in the bronchial tubes. Nothing of the sort need be anticipated; sound sleep is as valuable a tonic to a fibrillating heart as is digitalis; at times probably even more valuable, for the action of the digitalis or of any other cardiac tonic is likely to be more effective and more lasting if the patient can enjoy at the same time the beneficial effect of restful sleep.

The early stage of acute pneumonia affords yet another example of the oft-times beneficial effect of morphia or opium. In the later stages, especially in

it justifiable to give a brief account of the points we consider most important, omitting all theoretical speculation.

Limit Reaction and Nomenclature of Smears.

We consider as the most concise and suitable criterion for the limit reaction the disappearance of leucocytes in the vaginal smears stained by the Giemsa method—i.e., an animal that during the given observation time (see below) produces at least one smear without any leucocytes is said to have shown a positive reaction. This only occurs when the vaginal epithelium has thickened considerably, as in pro-œstrus and œstrus. Then the remaining epithelial cells in the smears gradually lose their nuclei and cornify. All intermediate stages may be seen, and in mice especially partial cornification is often the maximal reaction.

If all the cells are cornified, the symbol ++ is given; if no more than 5 per cent. of them show a nucleus the reaction is designated $+^{+}$. Both these reactions we call "double positive." If less than 95 per cent. but more than *half the epithelial cells present are deprived of nuclei* we designate it +; should less than 50 per cent. of the cells be completely cornified, the smear is characterised [±]. These two reactions we call single "positive." As the total absence of leucocytes is very rare, we include in the positive reactions those in which only a few leucocytes (but never more than 5 per cent. of the total number of cells) are present; this we indicate by adding a small — to the symbols mentioned.

All other preparations contain more than 5 per cent. of leucocytes and are termed non-positive, but here again we differentiate between the absolutely negative and those that show a certain reaction consisting of a relative increase of epithelial cells.

If more than one-third of all the cells present are epithelial this is designated by —E if most of them possess a nucleus; by —S if the majority have none. When more than two-thirds of all the cells present are epithelial and most of them have lost their nuclei, the symbol —SS is used. Smears belonging to either of these groups (—S or —SS), are considered to show an undoubted reaction.

To rule out the individual element as far as possible, all smears are examined by two trained observers independently; differences being submitted to the judgment of a third, whose opinion is final. We do not think it necessary to follow Loewe's method: exact counts of the various cell types are superfluous and practically impossible in routine standardisations.

Number of Animals.

To eliminate the individual element among the animals as far as possible, we advise the use of at least 12 for each more precise standardisation; nine animals at least should give limit (or stronger) reactions to satisfy our definition that the *unit be the smallest dose which in 75 per cent. of the animals injected produces the limit reaction.* Coward and Burn [1] only require 50 per cent. of limit reactions; from their curve it might be inferred that our unit is about 40 per cent. stronger than theirs, but when we standardised the same batches of hormone together the difference lay in the opposite direction. This may at first seem surprising, but the explanation probably lies in a third factor which we regard as of the utmost importance, and which Allen, Doisy, and others also recognised as essential.

Fractionation of Dose and Practical Standardisation.

The differences found by Coward and Burn (i.e., that whereas a certain dose gives positive results in one rat, ten times that dose remains inactive in another) only gain practical importance if this fractionation of the dose is omitted. They greatly depend upon the rapidity with which the hormone is eliminated; in pure aqueous solutions like our Menformon, therefore, this factor is of the utmost importance, as even a massive single dose scarcely stays long enough in the body to produce an undeniable effect. The same technique may be responsible for the erroneous opinion that there is no difference between the doses for mice and for rats. If one dose is broken up into, say, six fractions, and these are injected at rather regular intervals within 48 hours, then the results obtained are very regular, if smears are made every morning and on the third and fourth evening after the first injection. (We always inject 0·1 c.cm. at a time.)

In one of our experiments, for instance, $\frac{3{\cdot}6}{1000}$ mg. of dry substance, divided over six injections, made nine rats out of 14 react positively, while only one remained completely negative. On the contrary, out of 16 animals receiving $\frac{21{\cdot}6}{1000}$ mg. at once, none became positive and only two showed a certain action. The same holds for mice, though the differences are not usually so great. The proportion of the doses with which the majority of animals show a positive reaction is as 8 to 1 and 4 to 1 in rats and mice respectively. The curve representing the percentage of animals reacting positively [doubly and singly positive (see above) together] shows a steep rise on increase of dosage, so that differences in dosage of only 10-20 per cent. are often recognisable. This holds good whether the "limit" or the "double-positive" reaction is taken as a criterion. The former has to be preferred, however, for practical purposes. Another important point that has been confirmed by many thousands of experiments is that—provided the doses are appropriately divided—a fairly accurate impression may be obtained from experiments on three mice only, and a very exact determination from a dozen or so.

When the dose has been divided into three injections, given over 24 hours, smears should be taken every morning and also on the evening of the third day, to ensure that no important reaction is missed. If, as with water-soluble preparations, the dose is given in six injections over 48 hours, then an additional smear should be taken on the fourth evening. The positive stage often persists longer when large doses are used, as may be done for qualitative tests or approximate estimations; this applies to oily preparations especially. For exact standardisations, however, frequent smears are essential, however tedious they may be, but there is no need to multiply them beyond the number given above.

Individual Variations.

Variations from fully positive to fully negative reactions may occur with the same dose. Even the same animal repeatedly injected with the same dose may show inconstant results. A point of practical importance is that now and then, though very rarely, consistently hypersensitive animals are encountered, while others never show any positive reaction even to massive doses. A series of ad hoc experiments on mice showed that body-weight may be neglected. We were also unable to detect any differences between young animals and old ones, or between those used seldom and those used very frequently. Shortly before death mice and rats often show feeble reactions, but in practice this is negligible, for these animals die very rapidly when really ill. More important are the massive subcutaneous infiltrations that sometimes occur, especially after injection of oily material, for resorption may be so slow that the reaction is very retarded.

Day factors—a shift of the general sensitiveness of all animals in the same direction on certain days—seem to play a less important rôle than with insulin or thyroxin. Yet until they are definitely excluded we think it advisable to extend every standardisation over several days, using only a few animals at a time.

Sources of error.—When standardising aqueous solutions storage bottles and syringes should never come into contact with oil as the hormone is excessively adsorbable and soluble in this material. It is best to use two separate sets of utensils of completely different appearance, the one for aqueous and the other for oily solutions.

Standard Preparation.

Standardisation of the female hormone is in reality astonishingly simple and exact if the investigator has enough collaborators and enough animals. Moreover, if the technique outlined above is strictly followed,

[1] Jour. Physiol., 1927, lxiii. 270.

The father was Schick- and Dick-negative. He had not had scarlet fever or diphtheria. The mother, who had had scarlet fever at 4 years of age, which had left her deaf in one ear, was Schick-negative, but Dick-positive. She had not had diphtheria.

The case is of interest owing to: (1) the severity of the relapse (there is no doubt the patient would have died if antitoxin had not been given in the relapse); (2) the fact that 33 days after the relapse and 64 days after the primary attack the patient had not developed immunity; (3) that in spite of this an immunity, although it may prove to be temporary, was acquired by injections of toxoid antitoxin mixture.

Capacity to Produce Antibodies.

We would observe that the Schick and Dick tests (if positive) do not test the capacity of a person to produce antibodies when attacked by diphtheria or scarlet fever. It may be that there are three classes of individuals: (1) those with sufficient antibody-producing capacity both to survive the attack and cause immunity for a considerable period of time or permanently; (2) those with only sufficient antibody-producing capacity to survive the attack, but not to cause immunity; (3) those with not sufficient antibody-producing capacity to even survive the attack.

Adults who are Schick- or Dick-negative either: (*a*) have had a definite attack of the disease and been rendered immune; or (*b*) have possibly undergone a process of subinfection and autovaccination and been latently immunised in the manner suggested by Dudley; or (*c*) have a persistent hereditary immunity, which term we suggest is better than the one natural immunity generally used. On the other hand, adults who are Dick- or Schick-positive have either: (*a*) not been sufficiently exposed to infection, or (*b*) if exposed, have only had sufficient antibody-producing capacity to survive the attack and not to cause any lasting immunity. The existence of this class of persons explains the occurrence of "relapses" in diphtheria as well as in scarlet fever.

It also explains the difficulty in actively immunising certain individuals.

The view that relapses in scarlet fever are in *all* cases due to an implantation with a different "type" of streptococcus than the primary infecting one is a view which we think must be regarded critically. The work of F. Griffith [1] on the conversion of one "type" of pneumococcus into another shows that "types" are not permanent species and the "types" of haemolytic streptococci described in scarlet fever may prove to be even more readily interconvertible than the types of pneumococci.

No satisfactory typing of diphtheria bacilli has been adduced to explain "relapses" in that disease. We believe that in both scarlet fever and diphtheria the lack of development of active immunity in convalescence is the essential factor in the cause of the relapse.

Existence of a Class Lacking this Capacity.

The history of the case related and our experience of the lack of development of immunity in certain cases of scarlet fever suggests that there is a class of individuals in the community whose cells are incapable or only capable with difficulty of being educated to produce antitoxin and to react to a secondary stimulus. We would suggest that there is possibly a familial tendency with regard to the capacity for general and specific antitoxin production. If so, is this a Mendelian characteristic, i.e., is the capacity for the production of antitoxin in the body an inborn quality, and if so, is it transmitted to other generations? It is hoped to investigate this point if suitable cases occur.

The existence of the class of individuals deficient in antitoxin producing capacity (if such a capacity is a Mendelian characteristic) throws some light on the [illegible] and increasing incidence of diphtheria. If [illegible] of diphtheria were allowed to take a natural [illegible] those persons who were markedly deficient in antibody-producing capacity would not survive. Many, however, do survive because of antitoxin treatment. Hence the stock of such individuals remains and the process of natural selection which would otherwise apply is defeated.

A point of interest in the case is that although the patient failed to become immune after two consecutive attacks of diphtheria, yet she became immune after active immunisation. It is possible that the antitoxic serum had some effect in preventing the development of active immunity (as we believe occurs in some cases of scarlet fever), or it may be that the immunity now developed will only prove to be temporary, or it may be that the patient was already becoming immune and that the process was expedited by the active immunisation.

A case of scarlet fever described previously which was Dick-positive after an attack of scarlet fever and again after a "relapse" was still Dick-positive when tested three months after immunisation to a maximum dose of 5000 skin units of scarlatinal toxin.

[1] [illegible] "; see THE LANCET, 1928, [illegible].

A CASE OF EMPYEMA,

ACCOMPANIED BY ŒDEMA OF THE ARM.

By NORMAN HILL, M.D., M.R.C.P. LOND.,

SENIOR ASSISTANT PHYSICIAN, BELGRAVE HOSPITAL FOR CHILDREN, AND THE METROPOLITAN HOSPITAL.

THE following case is interesting, as it illustrates a complication of empyema to which I have been unable to trace references in the literature.

A boy of 4 was admitted to the Belgrave Hospital on May 1st, 1928, complaining of cough and swelling of the left arm. He had been quite well until eight weeks before, when a cough had developed; it grew worse and the child became feverish. A doctor was called in, and diagnosed bronchopneumonia. The patient remained in bed under treatment. Two days before admission the mother noticed swelling of the left arm and the child became short of breath, a condition which grew rapidly worse up to the time of admission. He never complained of pain and never vomited. He was said to have become much thinner but his appetite was not impaired. He had had an uncomplicated attack of measles two years before, but there was no history of tuberculosis.

On examination he looked ill and was flushed and sweating. The temperature was 98°, the pulse-rate 152, and the respiration-rate 60. There was marked dyspnœa and some cyanosis. The tongue was furred but moist. Some stomatitis was present. The left side of the chest was immobile and there was marked enlargement of the veins over the upper and anterior aspect. No thrombosed axillary veins could be felt. There was no bulging of the intercostal spaces. About three inches from the middle line in the second left intercostal space was a rounded swelling, one and a half inches in diameter and raised fully half an inch above the surrounding skin. The skin over it was natural and it was not hot, tender, or pulsatile; fluctuation was present. The apex-beat was neither visible nor palpable, but the cardiac impulse could be felt in the fourth right intercostal space, two and a half inches from the right sternal border. The entire left chest was dull to percussion and the breath sounds were absent on auscultation. The area of cardiac dullness extended three inches beyond the right sternal border. There was marked œdema of the left arm, particularly below the elbow; the dorsal aspect of the hand was puffy and pitted deeply on pressure. There was no œdema of the legs or of the right arm. The abdomen was somewhat distended and the liver could be palpated two inches below the costal margin. There was no ascites. The chest was aspirated, and thick, greenish-yellow pus obtained; subsequent bacteriological examination proved this to be pneumococcal.

Three hours after admission the empyema was opened under local anæsthesia by Mr. C. P. G. Wakeley, an incision being made in the eighth intercostal space in the posterior axillary line. About 34 ounces of pus were evacuated and open drainage employed. The patient stood the operation well, and the wound drained freely. Within 36 hours the œdema of the arm and hand had completely disappeared and the general condition had greatly improved. Apart from a mild attack of chicken-pox which began three days after the operation, convalescence was uneventful though slow. He was discharged from hospital on August 1st looking and feeling well, but the left side of the chest was markedly retracted.

His mother was instructed to see that he carried out the breathing exercises taught him in hospital, and in October

elderly people, their use is undoubtedly attended by considerable danger of respiratory failure; but certainly during the first two or three days they greatly diminish the strain upon the patient's strength by securing reasonable periods of sleep, so conserving his vitality for the trying time towards the termination of the illness and probably diminishing the chances of delirium, one of the gravest risks to life in acute pneumonia. They are, of course, particularly useful for patients in whom pain is an important factor in causing sleeplessness.

In all the above instances I have referred to the use of morphia or opium rather than one of the many milder synthetic hypnotics, of which so many have been introduced during recent years. Undoubtedly some of these are very valuable, but I am convinced that in cases of acute illness, in which fairly deep sleep lasting several hours is urgently required, none of them is so reliable or so lasting in effect as an adequate dose of morphia or opium. In our enthusiasm for new drugs we are apt to overlook the virtues of old and tried remedies.

Danger of Over-feeding.

In this connexion I may add that I believe there is a real danger of patients acutely ill being over-fed by the modern trained and qualified nurse, particularly by the night nurse. She is not taught sufficiently to realise that whilst the patient needs food by day, quiet and sleep are the essential factors to aim at by night, and that the ordinary laws of health are not suspended because a man happens to be ill. The average night nurse is only too apt to imagine she has not done her duty to her patient unless she has persuaded him to take almost, if not quite, as much food as her colleague on day duty.

Some years ago in an examination paper for senior nurses in a large London general hospital I asked the following question:—

"You are sent to nurse a man, aged 40, previously perfectly healthy, who has a sharp attack of influenza, with complete loss of appetite and a temperature of 103°. The doctor tells you to get him to take what food you can. State exactly what you would give him and at what times during the day and night."

Without a single exception the nurses said they would feed the patient every two hours both by day and by night; not one suggested that he should not be disturbed if asleep and two stated that if he would not take enough food by mouth they would feed him per rectum. Obviously these nurses had been definitely taught that because a man was ill enough to be kept in bed and had a sufficiently high temperature to be ordered fluid diet he must automatically be fed every two hours, quite irrespective of whether he might be soundly asleep, regardless of the fact that Nature was doing her utmost to indicate by loss of appetite that he would be much better without food, and that probably for many years previously, when his digestive powers were perfectly normal, he had never taken any food during the night, and that yet when he was ill, and his stomach secreting little or no gastric juice, it was to be given work to do every two hours throughout the night. I interviewed the matron of the hospital on the subject and came away with the conviction that she would have answered the question in a very similar manner to her nurses. Thus is the evil tradition perpetuated! Is it any wonder that the public generally share the conviction that directly a man is acutely ill the all-important thing is to feed him up at short intervals, so as to maintain his strength, and that the more milk and eggs he can be induced to swallow the better will it be for him? More than once I have seen real harm result from the carrying of this belief into practice; sometimes even a man's chances of recovery endangered or lost, often his discomforts increased, and his convalescence delayed. Occasionally I believe the obstinate refusal of a patient to swallow for a time anything except water has saved his life.

Truly how difficult it is for us to hit the happy mean of doing enough and not too much; we are so easily carried off our balance by the latest enthusiasm and the most recent fad or craze, with the result that a century ago we depleted, starved, sweated, purged, and venesected our patients, half a century later for the same disease we dosed them with brandy, until (to quote the words of a cynical surgeon about a distinguished medical colleague) we "sent them into the presence of the Almighty in a beastly state of intoxication," and now we only too often pour milk and eggs into the stomachs of patients utterly unable to digest them.

A SEVERE "RELAPSE" IN A CASE OF DIPHTHERIA.

By A. H. G. Burton, M.D. Lond., D.P.H.,
MEDICAL OFFICER OF HEALTH, ILFORD;
AND
A. R. Balmain, M.B. Lond., D.P.H.,
DEPUTY MEDICAL OFFICER OF HEALTH, ILFORD.

The text-books generally agree that a "relapse" in diphtheria occurs in about 1 per cent. of the cases. Goodall states that a relapse may be more severe than a primary attack. Both Ker and Rolleston agree that a severe relapse is uncommon. In our experience a true relapse with definite spreading membrane is an extremely rare occurrence, and this is the first occasion one of us has seen it in a series of over 1100 cases.

It is true that a number of diphtheria convalescent patients have a rise in temperature with an exudate on the tonsils which on examination can be shown to contain virulent Klebs-Löffler bacilli. We believe, however, that most of these cases are due to secondary infection and that the positive K.L.B. swab is merely due to the fact that the patient's fauces are not yet free of diphtheria organisms. The condition clears up without antitoxin treatment. An examination of seven such cases for other organisms besides K.L.B. showed pneumococci in three instances and hæmolytic streptococci in the four others. Possibly the relapse-rate of 1 per cent. quoted above includes cases of this kind.

The Case Described.

The following is an account of an undoubted severe relapse.

The patient, a female aged 19 years, was admitted in March of this year to the Ilford Isolation Hospital on the third day of a moderately severe attack of faucial diphtheria. She had a considerable amount of membrane on both tonsils: the throat swab was positive for morphological K.L.B. 40,000 units of concentrated antitoxic serum were given intramuscularly within 24 hours. Three days later her throat was clear of membrane. Thirty-one days after the primary attack the patient's temperature rose to 100° F. and she developed a little membrane on the left tonsil. The swab showed morphological K.L.B. Within 36 hours the membrane had spread to both tonsils and over the soft palate. The patient's cervical glands were much enlarged; a purulent nasal discharge was present. She was toxic in appearance and it became urgently necessary to again treat her with antitoxin. She was tested with 0·1 c.cm. antitoxin intracutaneously and showed 2 inches erythema and induration within 50 minutes. She was desensitised, commencing with 100 units of antitoxic serum and a total of 56,000 units of concentrated antitoxic serum was administered intramuscularly. The nostrils were swabbed out also with antitoxic serum.

She made a slow but uneventful recovery apart from slight palatal paralysis, and was discharged a little over ten weeks from the date of admission. Thirty-three days from the day she commenced her relapse she was Schick-tested and found to be Schick-positive. She was immunised gradually by seven increasing weekly doses of toxoid antitoxin mixture, and when tested nearly three months after the last dose was found to be Schick-negative.

She was Dick-tested and found to be Dick-negative. The family history is of some interest. The patient had previously had scarlet fever (at 6 years of age), had been 11 weeks in hospital, owing, it was said, to a "relapse." The brother, aged 13, had had two attacks of scarlet fever in one year, was Dick-negative, but Schick-positive (and was immunised with toxoid antitoxin mixture). He had not had diphtheria.

The father was Schick- and Dick-negative. He had not had scarlet fever or diphtheria. The mother, who had had scarlet fever at 4 years of age, which had left her deaf in one ear, was Schick-negative, but Dick-positive. She had not had diphtheria.

The case is of interest owing to: (1) the severity of the relapse (there is no doubt the patient would have died if antitoxin had not been given in the relapse); (2) the fact that 33 days after the relapse and 64 days after the primary attack the patient had not developed immunity; (3) that in spite of this an immunity, although it may prove to be temporary, was acquired by injections of toxoid antitoxin mixture.

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[1] [illegible] THE LANCET, 1928, i.

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On examination he looked ill and was flushed and sweating. The temperature was 98°, the pulse-rate 152, and the respiration-rate 60. There was marked dyspnœa and some cyanosis. The tongue was furred but moist. Some stomatitis was present. The left side of the chest was immobile and there was marked enlargement of the veins over the upper and anterior aspect. No thrombosed axillary veins could be felt. There was no bulging of the intercostal spaces. About three inches from the middle line in the second left intercostal space was a rounded swelling, one and a half inches in diameter and raised fully half an inch above the surrounding skin. The skin over it was natural and it was not hot, tender, or pulsatile; fluctuation was present. The apex-beat was neither visible nor palpable, but the cardiac impulse could be felt in the fourth right intercostal space, two and a half inches from the right sternal border. The entire left chest was dull to percussion and the breath sounds were absent on auscultation. The area of cardiac dullness extended three inches beyond the right sternal border. There was marked œdema of the left arm, particularly below the elbow; the dorsal aspect of the hand was puffy and pitted deeply on pressure. There was no œdema of the legs or of the right arm. The abdomen was somewhat distended and the liver could be palpated two inches below the costal margin. There was no ascites. The chest was aspirated, and thick, greenish-yellow pus obtained; subsequent bacteriological examination proved this to be pneumococcal.

Three hours after admission the empyema was opened under local anæsthesia by Mr. C. P. G. Wakeley, an incision being made in the eighth intercostal space in the posterior axillary line. About 34 ounces of pus were evacuated and open drainage employed. The patient stood the operation well, and the wound drained freely. Within 36 hours the œdema of the arm and hand had completely disappeared and the general condition had greatly improved. Apart from a mild attack of chicken-pox which began three days after the operation, convalescence was uneventful though slow. He was discharged from hospital on August 1st looking and feeling well, but the left side of the chest was markedly retracted.

His mother was instructed to see that he carried out the breathing exercises taught him in hospital, and in October

his chest appeared quite normal and symmetrical and the left lung well expanded. The X ray, except for a slight haziness at the left base due to thickened pleura, appeared to be that of a normal chest.

The chief interest of the case is the œdema of the arm, which was apparently caused by mechanical pressure on the subclavian vein impeding the venous return. Considering the comparative frequency of empyema it is surprising that this symptom does not occur more often, especially when a large amount of pus has been allowed to accumulate owing either to inadequate supervision of the patient or to failure to diagnose the condition.

Medical Societies.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.

THE opening meeting of the session was held in London on Nov. 30th, when Dr. F. J. COUTTS gave a presidential address on

Venereal Diseases from the Epidemiological Point of View.

He said that of the evolution of the parasites of man, particularly those microscopic organisms associated with the production of disease in man, the profession was still profoundly ignorant. It was known, however, that pathogenic organisms varied in virulence, and such changes must be associated with some modifications, still obscure, in the life-history of the parasite and in its reaction to environment. Three modes of transmission of parasites of infectious diseases were known: (1) direct contagion, as in venereal diseases; (2) direct transmission by means of air, water, food, and so forth, as in influenza, pneumonic plague, cholera, small-pox; (3) indirect transmission—i.e., by an intermediate host, as in malaria. Recently there had been a revival of the idea of "epidemic constitutions," and some believed that climatic and meteorological conditions had a dominant influence. Statistical methods could not be expected to provide answers to the epidemiological problems involved. Gill had put forward a "quantum" theory—that all epidemic manifestations were essentially the outcome of loss of equilibrium between the dose of toxin and the degree of resistance, or between infection and immunity—claiming that the conclusions reached by Topley in his study of mice and by Dudley in investigating human diphtheria epidemics agreed with his theory. Gill considered that circumstances conducing to a sudden increase in the amount of infection, or infective quantum, played a predominant part in determining epidemic explosions.

In connexion with venereal diseases some of the characteristics of more typical epidemic diseases were found—namely, wave form, variations in virulence, seasonal incidence, special incidence upon certain age-groups. Syphilis, however, was much more chronic than the usual epidemic diseases, hence it was to be expected that the wave periods would be slow and lengthened out. The President was certain that at times syphilis occurred in epidemic form, the most remarkable instance being the outbreak at the end of the fifteenth century, which by many was confused with leprosy and on which he dwelt at some length. Incidentally he was unable to agree with the view that syphilis was introduced to Europe by Columbus and his sailors on their return from America. It most probably existed in Europe and Asia long before, and descriptions of it occurred in Chinese literature of 2000 B.C., and in a Japanese book of the ninth century. Several writers considered that the plague of Baal-peor, in which 24,000 Israelites perished, was syphilis. The large-scale epidemic of syphilis in this country at the end of the fifteenth century was not regarded by emporary physicians as in essence venereal, as there were so many extragenital chancres, but thi was explicable by the lack of personal cleanliness, th promiscuous sharing of beds and of drinking vessel without cleaning. There was some increase in syphili in England after the South African War, also afte the late war, but no indications of a very severe typ of infection. After the late war the increase in syphili seemed to have been greater in Russia than else where; Dr. Coutts quoted figures from that country The antiquity of gonorrhœa was generally wel recognised; it was the "running issue" described i Leviticus XV., and Moses enjoined scrupulous clean liness as a precaution against infection. Dr. Coutt was not aware of any records of great epidemics o gonorrhœa, nor even of local outbreaks of a highl virulent type.

Discussing the problem of immunity in a genera way, he said that recent work cast some doub on whether the phenomena observed could be full explained by natural immunity in a section of th population along with acquired immunity in those wh had had the disease and survived. In connexion wit syphilis the problem of immunity was particularl puzzling. No worker had succeeded in producin active immunity to syphilis, either in man, monkey or rabbits. Lesions had been produced, by inoculatio identical with those of spontaneous syphilis in patient already suffering from syphilis in various stage Topley's work suggested that latency was ver important in relation to infectious disease, and that i might have an important bearing on individual an communal immunity. Women who had neve presented clinical signs of syphilis might yet giv birth to syphilitic infants, and their Wassermar reaction might be positive.

Looking to the future, the President said there wa hope that a vaccine would one day be discovered whic would reach the gonococcus in its lair and destroy i In the case of syphilis the foe seemed even mor resourceful than the gonococcus. Arsenobenzo preparations had dealt the *Spirochæta pallida* a shrew blow, but it appeared that certain strains of th organism were being evolved which were capable c considerable resistance to arsenic. He had hopes tha by careful study of all aspects of the problem an perseverance there would come as a reward the fina mastery of this scourge of humanity.

Discussion.

Colonel L. W. HARRISON quoted a remark of th President that in some countries syphilis among th natives was mild in degree, but when immigrants t the country were attacked, it was severe. He though the different points of view could be reconciled b assuming the existence of different strains of the gerr of syphilis. Experimental research gave some suppor to this idea. For example, if a rabbit received a inoculation of one strain, and a chancre and orchiti ensued, then after 90 days the disease was eradicate by arsenobenzol treatment; in spite of that anima having been cured, one could not cause a fres chancre by injecting the same strain. If, howeve a different strain were inoculated, then a fresh chancr resulted. The sailors returning from America wit Columbus may have brought back a new strain o spirochæte into Spain, and the visitation so generate may have had all the virulence of a new disease o virgin soil. One authority had suggested that syphili had to be in a community for from six to ten genera tions before it began to affect the central nervou system, as in the production of general paralysis, an that after lasting a certain length of time, G.P.I declined. In this country general paralysis bega suddenly to decline in 1919, and the drop had gone o steadily until now. The President's point as to th latency of symptoms being coupled with the capacit to transmit syphilis to others was confirmed by experi ments on mice. The *Spirochæta pallida* was inoculate into mice, and their brains became virulent for othe mice, and yet the brains of the first showed no histo logical signs of reaction to the spirochæte. The questio of resistant and non-resistant strains might well b

rather one of changes in the tissues. In some patients the disease resisted the usual remedies, but a medicine which brought about a change in metabolism enabled the patient to make use of the antisyphilitic injections. One particular patient in the speaker's experience was continually relapsing; then he was given a dose of thyroid gland, and thereafter it became a tractable case, the same remedy being used throughout.

Dr. HARDY KINGSTON spoke of a visit to China, where he found that if a European contracted syphilis he had it in a much more severe form than did Chinamen. In Russia extragenital syphilis was very common, and over 90 per cent. of the population of some rural districts suffered from the disease.

Dr. E. T. BURKE said it was of considerable interest to settle the question of the date of the origin of syphilis in Europe, as the time factor was of importance in studying the subject. His view was that it originated in the New World, and was unknown in Europe until it was brought thence by the sailors with Columbus. Nothing appeared in records concerning congenital syphilis in Europe prior to 1493. He agreed with what had been said as to syphilis showing a greater severity in immigrants to a country than in natives. During the late war if a soldier serving in the East, as on the frontiers of Persia, acquired syphilis, usually it was of more virulent type than that seen in the inhabitants. And much the same sort of thing occurred during the Peninsular War.

Major A. DAWSON said there was an impression that a large number of the people of Trinidad were suffering from syphilis, but Dr. Wilson, the senior medical officer there on the civil side, said much of the prevailing sickness was due to yaws, which could be regarded as a near cousin to syphilis. It was of some importance to know whether having one of those diseases prevented the development of the other.

Dr. DOROTHY LOGAN suggested that perhaps strange climatic and living conditions in the case of the immigrant might account for the observed increased virulence.

The PRESIDENT replied. He said that the introduction into a community of a fresh strain of spirochæte might lead to a virulent type of the disease. His own idea of the action of arsenobenzol was, not that it killed the spirochæte directly, but that it so modified the body tissues that they were able to deal with the parasite. Climate and environment should not be omitted when considering the factors concerned in the continuance of syphilis and other venereal diseases.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF OBSTETRICS.

A MEETING of this Section was held on Nov. 23rd, with Dr. GIBBON FITZGIBBON, the President, in the chair.

Carcinoma of the Cervix: Treatment with Radium.

Dr. BETHEL SOLOMONS exhibited a specimen of carcinoma of the cervix, removed by the Wertheim method.

The patient, aged 36, was a 5-para, whose last baby was 11 months old. Two months after the birth menstruation returned and she had bled almost continuously for nine months when she came to the Rotunda Hospital. The growth was very extensive locally, but did not appear to involve either parametria, bladder, or rectum. The operation and recovery were without incident. Dr. F. S. K. Bourke reported that the specimen was "a solid carcinoma originating from the squamous epithelium of middle maturity. The tumour has infiltrated the cervix, but the proliferation is more external than internal." The measurement of a half section of the growth after removal was 4·5 c.cm.

Dr. Solomons dwelt on the fact that radical operation was the choice for a case of this type—i.e., a growth freely movable and of great magnitude. A large quantity of radium would be required for treatment of such an extensive growth. He gave X rays as a routine after operation.

Dr. D. G. MADILL, referring to the fact that the patient's last confinement had taken place only nine months before the finding of the tumour, asked if there had been any history of difficulty at the confinement, and said he did not think the tumour could have reached its present magnitude in nine months. He thought it probable that there must have been some evidence of malignancy at the confinement.

Prof. A. H. DAVIDSON said he thought it was time that an authoritative statement on the present position of radium and operation in cases of cancer of the cervix was issued. He had seen a great many inoperable cases which had been treated by radium in which the results had not been satisfactory, and could only remember one inoperable case which had been treated about four years previously, in which there had been no recurrence.

Dr. R. M. CORBET said he thought if carcinoma was found soon after confinement the prognosis was favourable, as this meant it was found in an early stage. He referred to a patient of his who had had a normal delivery in July, 1925, and who in December, 1926, had been sent to him again with a diagnosis of incomplete abortion. He had found a malignant condition, done a Wertheim operation, and the patient had been perfectly well since.

Dr. SOLOMONS, in reply, said that the patient was confined in the country 11 months previously, and he was informed there was no difficulty in the labour. He agreed with Dr. Corbet that a tumour discovered apparently soon after confinement probably meant a favourable prognosis. He did not believe that sarcoma was likely to be found in the microscopic sections. It was extremely difficult to estimate the relative efficiency of radium therapy and operation for carcinoma of the cervix. In both success depended on the skill of the operator. Heyman, of Stockholm, was getting excellent results with radium which he used in all cases; his technique was beautiful. It was difficult for men who had not a large quantity of radium, and who had not the experience necessary to obtain the best technique, to compare their results with those of Heyman and others. The same remark applied to the operation. The Wertheim operation was difficult, and the best results were obtained by the man with the largest experience. He (Dr. Solomons) advocated operation for operable cases, and he used radium for the other types. In the latter, working with Dr. Stevenson, he had had some striking improvements. It was an easy matter to pick out the authoritative papers on operation and radium therapy from the others.

Dr. SOLOMONS also showed a specimen of

A Large Fibroid.

The patient was aged 35, and had been married for one year. There had been no previous pregnancy, but amenorrhœa had continued for five months, with some slight abdominal pain. On examination a soft tumour, obviously a five months' pregnancy, was found in the lower abdomen; separated from it by a slight groove, and filling the whole of the rest of the abdomen, was a large hard somewhat regular tumour. This was freely mobile and slightly resonant on percussion. A radiogram confirmed the diagnosis of pregnancy. The spleen shadow was visible, and there seemed to be a slight connexion between the pregnant uterus and the tumour. The differential diagnosis lay between an enlarged spleen, a mesenteric tumour, and a large fibroid or an ovarian tumour. A blood count showed the red cells 3,336,000; hæmoglobin 60 per cent.; colour-index 0·9. On opening the abdomen it was obvious that the swelling was a fibroid; it filled most of the available space in the abdomen. Having been delivered, it was removed from the left cornu of the pregnant uterus and the cavity stitched. There were four other fibroids in the uterus, one of which was removed; there was very alarming hæmorrhage from the bed of this tumour which seemed to be over the placental site; the hæmorrhage was controlled by suture. It did not seem advisable to remove any of the other tumours, as they would not interfere with the pregnancy which was still progressing.

The PRESIDENT agreed with Dr. Solomons that the only treatment in this case was removal of the tumour. He thought the prognosis was good. He was specially interested in the diagnosis of this case, because he had recently seen at Mercer's Hospital a somewhat similar one. The patient had a fairly large

his chest appeared quite normal and symmetrical and the left lung well expanded. The X ray, except for a slight haziness at the left base due to thickened pleura, appeared to be that of a normal chest.

The chief interest of the case is the œdema of the arm, which was apparently caused by mechanical pressure on the subclavian vein impeding the venous return. Considering the comparative frequency of empyema it is surprising that this symptom does not occur more often, especially when a large amount of pus has been allowed to accumulate owing either to inadequate supervision of the patient or to failure to diagnose the condition.

Medical Societies.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.

THE opening meeting of the session was held in London on Nov. 30th, when Dr. F. J. COUTTS gave a presidential address on

Venereal Diseases from the Epidemiological Point of View.

He said that of the evolution of the parasites of man, particularly those microscopic organisms associated with the production of disease in man, the profession was still profoundly ignorant. It was known, however, that pathogenic organisms varied in virulence, and such changes must be associated with some modifications, still obscure, in the life-history of the parasite and in its reaction to environment. Three modes of transmission of parasites of infectious diseases were known: (1) direct contagion, as in venereal diseases; (2) direct transmission by means of air, water, food, and so forth, as in influenza, pneumonic plague, cholera, small-pox; (3) indirect transmission—i.e., by an intermediate host, as in malaria. Recently there had been a revival of the idea of "epidemic constitutions," and some believed that climatic and meteorological conditions had a dominant influence. Statistical methods could not be expected to provide answers to the epidemiological problems involved. Gill had put forward a "quantum" theory—that all epidemic manifestations were essentially the outcome of loss of equilibrium between the dose of toxin and the degree of resistance, or between infection and immunity—claiming that the conclusions reached by Topley in his study of mice and by Dudley in investigating human diphtheria epidemics agreed with his theory. Gill considered that circumstances conducing to a sudden increase in the amount of infection, or infective quantum, played a predominant part in determining epidemic explosions.

In connexion with venereal diseases some of the characteristics of more typical epidemic diseases were found—namely, wave form, variations in virulence, seasonal incidence, special incidence upon certain age-groups. Syphilis, however, was much more chronic than the usual epidemic diseases, hence it was to be expected that the wave periods would be slow and lengthened out. The President was certain that at times syphilis occurred in epidemic form, the most remarkable instance being the outbreak at the end of the fifteenth century, which by many was confused with leprosy and on which he dwelt at some length. Incidentally he was unable to agree with the view that syphilis was introduced to Europe by Columbus and his sailors on their return from America. It most probably existed in Europe and Asia long before, and descriptions of it occurred in Chinese literature of 2000 B.C., and in a Japanese book of the ninth century. Several writers considered that the plague of Baal-peor, in which 24,000 Israelites perished, was syphilis. The large-scale epidemic of syphilis in this country at he end of the fifteenth century was not regarded by temporary physicians as in essence venereal, as there were so many extragenital chancres, but this was explicable by the lack of personal cleanliness, the promiscuous sharing of beds and of drinking vessels without cleaning. There was some increase in syphilis in England after the South African War, also after the late war, but no indications of a very severe type of infection. After the late war the increase in syphilis seemed to have been greater in Russia than elsewhere; Dr. Coutts quoted figures from that country. The antiquity of gonorrhœa was generally well recognised; it was the "running issue" described in Leviticus XV., and Moses enjoined scrupulous cleanliness as a precaution against infection. Dr. Coutts was not aware of any records of great epidemics of gonorrhœa, nor even of local outbreaks of a highly virulent type.

Discussing the problem of immunity in a general way, he said that recent work cast some doubt on whether the phenomena observed could be fully explained by natural immunity in a section of the population along with acquired immunity in those who had had the disease and survived. In connexion with syphilis the problem of immunity was particularly puzzling. No worker had succeeded in producing active immunity to syphilis, either in man, monkeys, or rabbits. Lesions had been produced, by inoculation, identical with those of spontaneous syphilis in patients already suffering from syphilis in various stages. Topley's work suggested that latency was very important in relation to infectious disease, and that it might have an important bearing on individual and communal immunity. Women who had never presented clinical signs of syphilis might yet give birth to syphilitic infants, and their Wassermann reaction might be positive.

Looking to the future, the President said there was hope that a vaccine would one day be discovered which would reach the gonococcus in its lair and destroy it. In the case of syphilis the foe seemed even more resourceful than the gonococcus. Arsenobenzol preparations had dealt the *Spirochæta pallida* a shrewd blow, but it appeared that certain strains of the organism were being evolved which were capable of considerable resistance to arsenic. He had hopes that by careful study of all aspects of the problem and perseverance there would come as a reward the final mastery of this scourge of humanity.

Discussion.

Colonel L. W. HARRISON quoted a remark of the President that in some countries syphilis among the natives was mild in degree, but when immigrants to the country were attacked, it was severe. He thought the different points of view could be reconciled by assuming the existence of different strains of the germ of syphilis. Experimental research gave some support to this idea. For example, if a rabbit received an inoculation of one strain, and a chancre and orchitis ensued, then after 90 days the disease was eradicated by arsenobenzol treatment; in spite of that animal having been cured, one could not cause a fresh chancre by injecting the same strain. If, however, a different strain were inoculated, then a fresh chancre resulted. The sailors returning from America with Columbus may have brought back a new strain of spirochæte into Spain, and the visitation so generated may have had all the virulence of a new disease on virgin soil. One authority had suggested that syphilis had to be in a community for from six to ten generations before it began to affect the central nervous system, as in the production of general paralysis, and that after lasting a certain length of time, G.P.I. declined. In this country general paralysis began suddenly to decline in 1919, and the drop had gone on steadily until now. The President's point as to the latency of symptoms being coupled with the capacity to transmit syphilis to others was confirmed by experiments on mice. The *Spirochæta pallida* was inoculated into mice, and their brains became virulent for other mice, and yet the brains of the first showed no histological signs of reaction to the spirochæte. The question of resistant and non-resistant strains might well be

Shaw gave the classical characters of decidual formation as the presence of decidual cells together with round cells in a fibrillated matrix.

The decidual cell was normally and properly found in the endometrium where it was derived from the *stromal cell*, and it could be demonstrated in the premenstrual phase of menstruation and in uterine and extra uterine pregnancies. Its distribution, however, was much wider than this, for it had been found in the muscle wall of the uterus, the cervix, Fallopian tubes, ovaries, pelvic peritoneum, appendix, omentum, and various other organs (ectopic decidual cells). This distribution closely resembled that of endometrioma, and if one accepted Sampson's theory as to the causation of these tumours one was tempted to ask if the ectopic decidual cells had any relation to them. Wilfred Shaw did not accept Sampson's views on endometrioma, and explained the distribution by suggesting that the property of decidual formation was not inherent in all cells, but only in those derived from the subcœlomic connective tissue. In true cases of endometrioma, whether in the uterus, rectovaginal space, or ovaries, a decidual reaction could generally be demonstrated during pregnancy.

The occurrence of decidual formation in the ovary was stated to be very constant during pregnancy, whether the latter be uterine or extra-uterine, and Wilfred Shaw and others had found a similar change during menstruation. The cells were arranged usually in groups in the connective tissue of the tunica albuginea, and formed either nodules projecting from the surface of the ovary or flattish areas. More rarely the cells were found deep in the cortical stroma. In the case of ovarian pregnancy which he had described there was a very well-marked nodule of decidual cells immediately under the surface of the ovary. It was formerly supposed that decidual cells were produced through the local stimulus of the embedded ovum, but this view was untenable at the present time, for it was now realised that the decidua of pregnancy was merely a further development of the decidua found during the pre-menstrual phase, and was developed whether the ovum was in the uterine cavity or elsewhere. As a matter of fact, pregnancy was not necessary for the formation of a decidua at all, for Loeb was able to produce this structure in rabbits during pseudo-pregnancy by injuring the lining of the uterine cavity. This observer's experiments appeared to show that the primary factor in the formation of the uterine decidua was the presence in the circulating body fluids of a hormone developed in the corpus luteum. This hormone sensitised the uterine mucosa and other cells which then formed a decidua in response to any non-specific irritation.

The PRESIDENT described the occurrence of islands of decidual tissue on the peritoneal surface of the utero-vesical reflexion. He showed microscopical sections of such an island which, though easily removed by light pressure, left a raw, bleeding surface behind.

Mr. W. W. KING (Sheffield) said that he had excised one of these rusty-looking ovaries at a Cæsarean section about the time of the publication of Wilfred Shaw's paper, and had found decidual cells both on the surface and in the substance. The latter were of special interest, as they appeared to be either a decidual change in the connective tissue cells of an old corpus luteum or a metaplasia of the lutein cells themselves into decidual cells. He showed slides illustrating the presence of the decidual cells arising in the corpus luteum, but confessed that he was unable to determine from which type of cell they arose. He had seen similar rusty-looking ovaries in the course of operations upon fibroids, but on section these only showed connective tissue and mesothelial cells derived from the peritoneum.

Prof. DONALD also reported a case of ovarian pregnancy and two cases of red degeneration in fibroids; Dr. E. A. GIBBARD (Manchester) described a case of rupture of the uterus; Mr. KING spoke on the formation of an artificial vagina; Dr. K. V. BAILEY gave an account of a case of melanotic sarcoma of the vagina with secondary deposits in the inguinal glands; and Prof. DONALD showed specimens of uterus subseptus and carcinoma of the cervix and body of the uterus.

ROYAL SOCIETY OF MEDICINE.

SECTION OF ORTHOPÆDICS.

AT a meeting of this Section on Dec. 4th the chair was taken by Mr. NAUGHTON DUNN, the President, and a discussion on the

PAINFUL SHOULDER

was opened by Mr. GEORGE PERKINS. The term, he said, conjured up the vision of a more or less constant clinical syndrome, though the pathology was to many hazy and the treatment often empirical. He excluded "shoulder-tip" pain, which had few mysteries and might occur whenever the phrenic nerve was irritated. Of the painful shoulder proper the symptom was pain, usually felt a few inches above the insertion of the deltoid and often continued down the outer side of the arm as far as the hand. There was little or no muscle wasting, no reaction of degeneration, no alteration in sensation or the reflexes, and no tenderness of the main nerve-trunks. Movements increased the pain and the weight of the arm caused a constant ache in the limb. Four types might be disentangled from the medley: (1) adhesions, (2) tendonitis, (3) osteo-arthritis, and (4) subacute arthritis.

Adhesions round the capsule often followed trauma passing up the arm and spraining the shoulder-joint in its course. Hæmorrhage caused scar tissue, and the patient complained of stiffness of the shoulder and pain on movement. Some or all movements were limited, particularly rotation and abduction, but only in the outer half of their range. The inner half was painless and free of spasm. This type was preventable and curable. The shoulder-joint should be kept mobile after falls on the hand, whether or not it seemed to have been damaged. If adhesions were allowed to form they could be broken down under anæsthesia. It was preferable to mobilise repeatedly in stages under nitrous oxide anæsthesia, so that the patient could begin active movements immediately. Physiotherapy without manipulation was valueless.

The symptoms of *tendonitis* had been described by Codman in 1906 under the title of "subdeltoid bursa"—a term which was not consistent with the pathology. Often after unusual exertion, often spontaneously, severe pain began over the outer side of the lower half of the deltoid, sometimes also round the external epicondyle and down the hand, varying in intensity and worse at night. There was a tender spot over the greater tuberosity of the humerus which disappeared on abduction of the arm. There was no swelling or heat. Movement was full, but painful through a small arc, from about 75°–90° of abduction with the shoulder slightly forward and slightly internally rotated. The disability varied enormously. Most often it was merely a nuisance; the patient forgot his shoulder until he reached the painful arc and then broke off his movement and might drop things. If he avoided the movements causing pain the condition quieted down in a few days or weeks, only to recur on undue exertion. Occasionally the attack might be so severe as to suggest fracture and require morphia. The shoulder muscles did not go into protective spasm. Suggested aetiological factors included bursitis and calcareous deposits beneath the bursa in the tendon of the supraspinatus. In Mr. Perkins's opinion these were seldom seen, but roughness of the greater tuberosity was common. Moschowitz had concluded that the cause was tendonitis, small areas of tendon undergoing necrosis and calcareous degeneration after trauma. It was plausible to explain the pain as due to the humeral head impinging on the beak of the acromion process, and bursitis would prevent this impact. Sepsis was not an important aetiological factor. Every conceivable form of treatment had been

tumour filling the middle of the abdomen which at first suggested a spleen, but the blood count negatived this. The abdomen was opened and a malignant growth of the mesentery was found.

Prof. A. H. DAVIDSON showed a specimen of

Myomatous Uterus with Amputated Fallopian Tube.

The patient, aged 50, complained of irregular and heavy uterine hæmorrhage for the past six months. She had been married for 26 years and had no children or miscarriages, and her menstrual periods had been regular up to six months ago. A fibrous polypus was found protruding from the cervical canal and a multinodular fibroid uterus. In view of her age Prof. Davidson decided to perform hysterectomy. At operation a peculiar and interesting condition of the right tube was found. There was a complete amputation of the tube at the inner end of the isthmal portion, and there was a thin fibrous cord running from that point to a cystic enlargement filled with caseous material, adherent to and embedded in a portion of the omentum. It seemed as if the tube had become parasitic on the omentum. The left tube, the seat of old-standing salpingitis, was disorganised. A hysterectomy and double salpingo-oöphorectomy was performed. Dr. F. S. Bourke, who examined the tube, reported as follows: "A section of the peduncle attached to the large caseous mass, consists of a fibromuscular structure resembling in arrangement the muscle wall of the Fallopian tube. There is no evidence, however, of any epithelial lining. I am unable to say definitely that this is an amputated tube, but it seems the most likely explanation for its occurrence in such a situation. Smears of the caseous matters were examined, but no tubercle bacilli were found."

The PRESIDENT thought that this was an amputated tube, as the lumen of the tube was filled with caseous material.

Dr. NINIAN FALKINER thought that it was a caseous gland. As a rule the caseous mass was in the upper part of the tube, and in this case it had been in the omentum which he regarded as being rather against the condition being an amputated tube.

Dr. W. H. ASHMORE reported a case of Puerperal Septicæmia.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

AT a meeting of this Society, held in Manchester on Oct. 26th, with Mr. LEITH MURRAY (Liverpool), the President, in the chair, a case of

Sarcoma of the Uterus

was described by Prof. DANIEL DOUGAL (Manchester).

The patient was 58 and had been married 33 years. She had borne one child 25 years previously. Fourteen years ago one breast had been removed for carcinoma, and three years later a similar growth was removed from the opposite breast. The menopause occurred at 55, and after this there were one or two irregular periods, and then nothing was seen until about seven months before operation. During this period of seven months she had had a constant blood-stained and yellowish discharge. She complained of no pain, the discharge being the only trouble and the one for which she sought medical advice. Her general health had not been good for six months.

On examination the uterus was much enlarged and formed a firm uniform tumour reaching almost to the umbilicus. A diagnosis was made of carcinoma of the body of the uterus or carcinoma with fibroids, and she was admitted immediately to hospital. She was operated upon on Feb. 11th, 1928, and the uterus was removed with both appendages. One or two enlarged glands were also removed from the iliac groups. The uterus was about the size of a five months' pregnancy, and contained a large necrotic growth in its cavity. There were also one or two small fibroids. The hysterectomy was perfectly straightforward, and the patient made an uneventful recovery and went home at the end of three weeks.

The uterus measured 7 inches in length, 5 inches in width, and 4 inches antero-posteriorly. There was a fibroid about the size of a walnut low down on the right side, and one or two smaller fibroids elsewhere in the wall of the uterus. The enlargement of the uterus was due to a large necrotic tumour which filled the cavity and showed areas of hæmorrhage. Microscopic examination showed the growth to be a round-celled sarcoma, so presumably it originated in the endometrium.

Three months after discharge from hospital the patient complained of severe sciatica in her right leg. On examination Prof. Dougal found a definite fixed swelling in the right side of the pelvis, and advised that there was nothing more to be done except to relieve her pain. However, as her own doctor was anxious that some further treatment should be tried, she was readmitted, and Dr. G. E. Birkett applied radium by needles inserted into the right vaginal fornix. This treatment did not improve matters, for within four weeks she had become so ill that she had lost the use of her lower limbs. She was admitted to the Christie Hospital, where she died in about a fortnight's time, four months after the uterus was removed.

Dr. C. Powell White made a *post-mortem examination*, and reported: "There is a recurrent mass of growth occupying the pelvis and infiltrating the vagina and bladder, giving rise to acute cystitis. The growth has extended along the walls of the pelvis behind the rectum, but the latter is not infiltrated. The growth has involved the upper part of the sacrum and the adjacent portions of the ileum on both sides, and has invaded the spinal canal producing compression of all the roots of the cauda equina. There are no enlarged glands and no metastases. The sites of operation in both breasts are quite sound. Microscopically the growth is a small round-celled sarcoma, and is infiltrating the bladder, muscle walls, nerves, and bones."

In his own experience, said Prof. Dougal, sarcoma was a very rare tumour. He had only seen four of them during the last three years. The majority of the patients had been elderly women, past the menopause. A point of interest in the present case was the extraordinary infiltrating power of the tumour which had largely destroyed the sacrum and lower part of the spinal cord.

Dr. C. P. BRENTNALL (Manchester) showed a specimen of sarcoma of the uterus. He pointed out that the growth was largely submucous, apparently in process of becoming polypoid, although in places it reached almost to the peritoneal surface of the uterus. It was nowhere encapsulated, but macroscopically it was of the circumscribed variety. He thought it was a primary sarcoma of the uterine muscle, arising as such de novo, and not in a pre-existing fibroid. In the fresh state the tumour was soft and the cut surface presented a yellow and lobulated appearance. There was no hæmorrhage into the tumour, nor evidence of gross necrosis or formation of cystic spaces such as was described as occurring in these tumours. Sections of the tumour showed it to be composed of solid masses of small round cells. There was nothing to suggest a fibromyoma. The patient was alive and well two years after operation.

Prof. ARCHIBALD DONALD (Manchester) discussed the diagnosis of sarcomata, and the PRESIDENT commented on the extreme malignancy of the tumours in his experience.

Prof. DOUGAL also read a note on

Decidual Formation in the Ovary during Pregnancy.

He said that when performing Cæsarean section or some other operation on the pregnant uterus he had often been struck by the peculiar appearance of the ovaries. The outer surfaces were streaked or mottled with a reddish-brown material, and this on microscopic examination was seen to be composed of irregular outgrowths of connective tissue apparently derived from the tunica albuginea. The cells of this tissue frequently showed a decidual reaction. The ovary which he was now showing was removed along with a three months gravid uterus from a woman with severe mitral stenosis in whom it was considered advisable to terminate the pregnancy and perform some sterilising operation at the same time. Both ovaries from this case showed the streaked appearance he had described, but in this particular one the condition was more marked and almost resembled a papillary growth. Its appearance on microscopic examination was that of typical decidua. The decidual cell was generally described as being large and oval with faintly granular and vacuolated protoplasm and a prominent nucleus. Both nucleus and protoplasm stained faintly with the usual reagents. The cells themselves lay in a fibrillar matrix, and around them were numbers of small round cells. Wilfred

Public Health Services.

PORTS OF MEDICAL OFFICERS OF HEALTH.

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At the end of the year there were 2080 cases on the tuberculosis register, more than ten times the average number of annual deaths. Of 398 contacts examined five were found to be suffering from respiratory and two from "other" tuberculosis, while 21 were classed as "suspect." Artificial sunlight has been introduced at Thingwall Sanatorium. Dr. Mathieson reports: "On the whole our experience has been that artificial sunlight, judiciously and carefully employed, has proved its worth. But it must not be thought to compare in efficacy with natural sunlight." At the V.D. clinics 100 per cent. increase in the new female gonorrhœa cases is regarded as a satisfactory feature. There were seven cases of encephalitis lethargica notified, five of which ended fatally. Immunisation against diphtheria is offered at the infant welfare clinics, and at the end of the year 176 children had received the full course. The staff at the hospital and patients suffering from other diseases are immunised against diphtheria. A child admitted during 1927 with severe diphtheria was one for whom immunisation was refused in the previous year. The antenatal clinic was attended by 85 women in their first pregnancy and by 309 in a second or subsequent pregnancy. A satisfactory feature was the increased attendance of primigravidæ. The total births numbered 2879.

tried and symptoms disappeared in time with or without treatment. In the ordinary subacute type it was sufficient to avoid all painful movements. For the acute type many surgeons had had success from removal of the calcareous deposit (Carnett's operation). The only alternative to operation was complete fixation in mild abduction or hyperabduction. If pain was so acute as to need anæsthesia for splinting operation was indicated. When the acute symptoms subsided active exercises and heat were beneficial. Manipulative surgery was of no value unless the shoulder had lost its full range of movement.

The symptoms of *osteo-arthritis* might develop insidiously, but often followed over-use of the arm. There was a dull ache in the arm, stiffness of the shoulder, and pain on movement; a diffuse slight tenderness, a little wasting of the muscles, and limitation of all movements, which were painful at their extremes only. Pathogenesis and treatment were the same as for osteo-arthritis elsewhere. Physiotherapy was valuable, especially heat and graduated faradism to the shoulder muscles, particularly the abductors.

Subacute arthritis might develop insidiously or might follow trauma or over-use. The symptom was pain on all active or passive movements, but there was little discomfort at rest. The muscles went into spasm and the humerus and scapula moved as one; therefore rotation was more painful than abduction. Radiograms revealed bone atrophy. Many patients were benefited by removal of septic foci. The joint should be rested, preferably in abduction, until muscle spasm disappeared and the patient could lift the arm from the splint. Active movements and faradism should be encouraged as soon as the patient allowed.

Discussion.

Mr. ALAN TODD described an investigation into 52 cases of dislocated shoulder, which had shown that treatment by abduction gave much better end-results and a much quicker recovery than binding the arm to the side. In no case had there been recurrence. The rent was on the inferior aspect of the capsule, and abduction brought the edges into the best possible apposition. The results of binding the arm to the side were disastrous. Applying this result to other shoulder injuries, he argued for their abduction treatment. Inability to abduct the arm beyond the horizontal was the commonest sequel of even minor injuries to the shoulder in people over 50; this meant incapacity for work at most trades. Results of treatment were very unsatisfactory in these people; their adhesions should never be allowed to form. Even coarse grating did not always mean osteo-arthritis; it might be intra- or sub-muscular. Elderly people who developed osteo-arthritis after an injury were usually those who had had a mild injury.

Dr. A. MERCER described 844 cases of stiff shoulder seen by him as surgeon to an insurance company. Only 98 had recovered within three months; 379 ended in partial and 99 in total permanent incapacity. Nearly all of them had been treated at general hospitals. The patient's resistance was greatest just after the accident, when drastic measures were most likely to succeed. Too often the feelings of the patient were considered and early treatment was too mild or too gradual. It should begin by fixation in abduction, combined with external rotation, followed by gentle movements as soon as pain allowed. The discomfort of the position was a detail compared with the discomfort of adhesions later.

Mr. J. R. LEE said that the shoulder was a muscularly strong joint and almost all its muscles were tendinous, the deltoid particularly having many long tendinous intersections. To this was due the persistence of pain, for tendon was ill-supplied with blood and healed less easily. The large cul-de-sac below the glenoid cavity was bound to have adhesions in it if the arm were put up in adduction. He always adopted Mr. Todd's method, and was sure that these shoulder cases should not be left to house surgeons. He described several cases, illustrating his belief that that there was more outpouring of blood than was usually recognised.

Mr. B. W. HOWELL described cases of sub-deltoid "bursitis" in one of which calcareous plaques had been seen by X ray but there was no inflammation of the bursa, while in the other there was a bursitis. Operation had cured both. Pain along the bicipital groove might be caused by inflammation of the subscapularis tendon, and was best treated by manipulation and hyperextension. Pain immediately after trauma was due to bruising of the glenoid cartilage; later pain came from immobilisation of the shoulder in the course of treatment. He did not like nitrous oxide for manipulation because complete muscular relaxation was not obtained.

Mr. MCCRAE AITKIN pointed out that the shoulder stiff from disuse was quite different from the painful shoulder. He deprecated the word "tendonitis"; "tenosynovitis" covered both this condition and the calcareous plaques. The acromio-clavicular joint and its meniscus was subject to curious pains, and might have ætiological significance. He described a case of pain associated with spiculation about a torn origin of the deltoid, and suggested that this might occur in other situations. Painful shoulder might start a few weeks after an injury—such as Colles' fracture—from contusion of cartilage; not until new vascularisation crept in could the joint become painful. The treatment was absolute rest until the disability disappeared. Most cases of painful shoulder could be treated by rest and painless voluntary movement from the start.

Dr. J. F. BRAILSFORD reviewed 347 radiographs of painful shoulders; 177 of them had been normal radiologically. Seventy-five had had arthritic changes; 29 had been tuberculous, while 35 had had old undiagnosed fractures (usually of the greater tuberosity) or loose bodies. The commonest lesion was arthritis of the acromio-clavicular joint, usually shown by irregularity of the articular margins. Calcified cysticerci or trichina might cause shoulder disability.

Mr. ROWLEY BRISTOW said that Mr. Mercer's figures were terrible and of paramount importance; this high incidence of incapacity ought to be ventilated.

Dr. S. S. BARTON said that general practitioners met many cases of painful shoulder which never got to the surgeon; they were acute inflammations of the fibrous and tendinous intersections in the muscles, and were cured in a few days by mustard plaster or salicylates in large doses. Another type of case was neuritis, causing muscle wasting; these recovered under electrical treatment.

The PRESIDENT showed two radiographs from patients with pain in the shoulder. One was a woman of 37 who had had occasional violent pains in the shoulder for 26 years, dating from three years after a fall. The left shoulder-girdle and arm were wasted. The attacks had increased in frequency until she was having them every three or four hours. X rays showed a small foreign body between the clavicle and the scapula, and its removal gave complete relief. The second patient had fallen 11 months earlier and had developed persistent pain in the shoulder. X ray revealed dislocation of the cervical spine. Painful shoulders were the great bugbear of the orthopædic surgeon; treatment must depend on diagnosis. It was important to know if the patient could lie on the shoulder—if so inflammation was not present; also if movement were gradually improving—if so recovery would be aided by forcing movement. He believed that subacute arthritis was the commonest cause and that it was often toxic in origin. Only those who could lie comfortably on the shoulder and had only some of their movements limited were relieved by breaking down adhesions. Operation was the only treatment for acute pain due to calcareous deposits. It was possible to have fluid in the sub-deltoid bursa in cases of shoulder pain; these cases recovered with rest, but operation might hasten their recovery.

Mr. PERKINS, in reply, emphasised that his second group was not one of tenosynovitis, because there was no sheath over the insertion of the supraspinatous muscle.

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Owing to financial stringency, the dental scheme has hitherto been confined to following up the 6- and 7-year olds, but a second dentist was appointed in November and the scheme will be enlarged. Out of 24,000 elementary scholars 6608 were inspected in 1927; 4166 needed treatment, and 59 per cent. requested to be treated at the dental clinic. Among the school service needs mentioned are classes for partially blind children, an open-air school and hospital treatment for cases of nose and throat obstruction. Owing to the difficulty in using X rays for ringworm in very young children, internal treatment by thallium acetate has been tried. The four children, aged from 2 to 4 years, treated by this method were completely cured.

Preston.

Dr. F. A. Sharpe states that the antenatal work gives promise of success. The new patients at the municipal clinic during the last three years numbered 73, 163, and 272 respectively. About 20 per cent. of the births occur in maternity homes, and at each of the two principal ones there is a carefully organised (non-municipal) antenatal centre. The outstanding need is the coördination of the branches of the public health service so that one health visitor may perform all the district visiting in her particular area. Employment was much better in Preston during 1927. Better control is needed for the houses-let-in-lodgings, which include 156 tenancies and house 430 persons. The same comment applies to the 50 permanent vans, housing 124 persons, some of which are arranged in colonies or camps. Of 325 milk samples examined for tubercle 18 gave a positive result. There are only ten cow-keepers in the borough, producing 354 gallons of milk daily. Among these "inside" milch cows two cases of tubercle of the udder and two of other forms were found, and dealt with under the Order.

Influenza was very severe in January and February, and the deaths attributed to it numbered 102. The insurance scheme, by which mothers, when booking midwives, secure medical aid if needed, is on a small scale as yet, but is proving expensive because the doctors are called in to 57·7 per cent. of the cases.

Norwich.

Dr. V. F. Soothill reports that there is a little less unemployment, but that the distress of the last two or three years has necessitated an increased issue of free meals and milk for mothers and children. Some progress has been made with respect to housing. During 1927, 1115 houses were built, including 843 municipal. This makes a total of 3111 new houses since 1918, including those erected for the dishoused inhabitants of slums. Fewer cases of overcrowding are being reported; and progress is being made with three insanitary areas. Dr. Soothill puts in a strong plea for a certain proportion of the council houses with less than three bedrooms. The old houses of Norwich are frequently unsuitable for reconditioning, as they are worn out and badly arranged. The municipal maternity home admitted 223 women for confinement, and its antenatal clinic was attended by 448 expectant mothers. Of 100 samples of milk examined biologically for tubercle one gave a positive result, and the offending cow was traced and destroyed. Uncomplicated cases of scarlet fever are discharged from hospital after four weeks. There were ten notifications of encephalitis lethargica and five deaths. No case of diphtheria has occurred among the hospital staff since immunisation was introduced in November, 1924.

Rotherham.

Dr. W. Barr reports a year of progress. The smoke nuisance is being faced, and the Sheffield and Rotherham Statutory Smoke Abatement Committee is now a going concern. Accommodation for the mentally deficient is rapidly attaining a practical aspect. An orthopædic scheme for children under 5 years is to be linked up with the school medical service. A new maternity and child welfare centre has been opened, and needs ultra-violet apparatus in view of the prevalence of rickets in Rotherham. Other needs are X ray apparatus for the sanatorium and dental treatment for expectant mothers and tuberculous patients. The number of new houses in 1927 was 322, including 260 municipal. Some small improvements have been made in the slums. Dr. Barr draws special attention to the difficulty in getting houses renovated owing to the tenants being in arrears with their rent, and gives many instances of this hardship to owners. There are 30 registered cow-keepers in the borough, and ten milch cows were slaughtered under the Tuberculosis Order. Twenty-seven cases of small-pox were reported with no deaths. Diphtheria became prevalent during the later months of the year. There were 104 cases notified and 17 deaths. The epidemic was associated with three schools in turn. Swabbing was adopted for suspicious children, and the virulence test was found useful. Out of 48 carriers of diphtheroid germs four were found to be harbouring a virulent type. Three were cases of ear discharge, and one a school teacher who was absolutely well. Syringing and gargling with a concentrated solution of magnesium sulphate were thought to be useful in drying up the ear discharge and shortening the carrier stage.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED NOV. 24TH, 1928.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 199 (last week 162); scarlet fever, 2766; diphtheria, 1390; enteric fever, 45; pneumonia, 1092; puerperal fever, 52; puerperal pyrexia, 111; cerebro-spinal fever, 3; acute poliomyelitis, 13; acute polio-encephalitis, 2; encephalitis lethargica, 25; dysentery, 19; ophthalmia neonatorum, 93. No case of cholera, plague, or typhus fever was notified during the week.

The cases of small-pox were notified in the following 18 counties:—London, 5; Chester, 7 (Ellesmere Port and Whitby); Derby, 25; Durham, 31 (of these Jarrow 21); Essex, 4 (West Ham); Lancaster, 23 (of these Mossley 15); Leicester, 11 (county borough 9); Lincoln, Parts of Holland 1, Parts of Kesteven 1; Northumberland, 4 (Newcastle-on-Tyne, Tynemouth, 2 each); Nottingham 5; Peterborough, 4 (county borough); Stafford, 11; Wilts, 11 (Swindon 5, Highworth R.D. 6); Yorks, East Riding 1 (Hull), West Riding 31 (Halifax 17; Pontefract, 5); Glamorgan, 13; Monmouth, 11.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Nov. 27th-28th was as follows: Small-pox, under treatment 18, under observation 4; scarlet fever, 2624; diphtheria, 2093; enteric fever, 18; measles, 76; whooping-cough, 332; puerperal fever, 17 (plus 9 babies); encephalitis lethargica, 73; poliomyelitis, 4; "other diseases," 18. At St. Margaret's Hospital there were 10 babies (plus 5 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox (there was no death from small-pox in the returns for the month of October from areas other than the 107 county boroughs and great towns), no death from enteric fever, 15 (0) from measles, 5 (1) from scarlet fever, 28 (4) from whooping-cough, 34 (5) from diphtheria, 61 (9) from diarrhœa and enteritis under two years, and 49 (9) from influenza. The figures in parentheses are those for London itself.

Stockton-on-Tees reported 3 fatal cases of measles, Liverpool, Hull, and Sunderland 2 each. There were 4 fatal cases of whooping-cough at Liverpool and 3 at Manchester. Diphtheria accounted for 3 fatal cases at Manchester, and diarrhœa for 8 fatal cases at Liverpool, 7 at Manchester, 5 at Salford, and 3 each at Leeds and Middlesbrough, while the figures for the same week for Glasgow, Dublin, and Belfast were 6, 2, and 2 respectively. Influenza claimed no more than 2 deaths in any town.

The number of stillbirths registered during the week in the great towns was 260 (corresponding to a rate of 43 per 1000 births), including 49 in London.

Reviews and Notices of Books.

ANATOMY.

Pocket Atlas of Anatomy. By VICTOR PAUCHET and S. DUPRET. London: Humphrey Milford. Oxford University Press. 1928. Pp. 306. 297 plates. 12*s.* 6*d.*

Dr. Pauchet and Mr. Dupret are associated with the Medical School at Amiens, where the former taught anatomy and operative surgery, while the latter exercised effectively his powers as an anatomical artist. In conjunction with Mr. Gaston Doin they have produced a charming little work which Mr. Humphrey Milford now brings before the medical public in this country. The book provides something new. The long list of atlases, previously published, from Joannes Ketam to the latest issue of Carl Toldt, includes no "pocket" atlases; but this one will go into any pocket save that of a waistcoat. There is no text except the labels which are placed on the drawings, and there are no legends, but only titles. The drawings are dainty and exquisitely done. They are clear in spite of their size. All the important points in each figure are labelled, and, where necessary, measurements are given. After working through the skeleton and joints, the authors depict the body, treated in a more regional manner, and finally some 20 plates are devoted to schematic representations of lymphatic distributions. Altogether this is a work which will be greatly appreciated by students of all sorts and will doubtless soon be in common use among them. The authors go so far as to express the hope that it will be in the pockets of those going in for examinations, but they do not suggest any means of dealing with the situation if it should be found there. However, this may be one of the things they manage better in France. The old terminology is used, but, for those who have a liking for foreign tongues, the B.N.A. is added in brackets.

A Shorter Anatomy. By E. WOLFF, M.B., B.S., F.R.C.S. London: H. K. Lewis and Co., Ltd. 1928. Pp. 151. 18*s.*

THIS book is intended mainly for those who are revising their anatomical knowledge for their final examinations, but it will also be found useful by more junior students. The medical and surgical application of points described is given at intervals throughout the book, which is an eminently readable little work. Wherever we have tested it it has not failed to give us accurate information in a simple and lucid way. The illustrations are clear and show diagramatically what they are meant to show. A good feature is a chapter, with X ray photographs, dealing with epiphyses. The book is well produced in easily readable type.

Surface Anatomy. By ARTHUR ROBINSON, M.D., F.R.C.S., Professor of Anatomy; and E. B. JAMIESON, Lecturer on Anatomy in the University of Edinburgh. London: Humphrey Milford. Oxford University Press. 1928. Pp. 175. 15*s.*

THE names of the authors of this book are sufficient guarantee of the accuracy and value of its contents. It is not a collection of surface-markings, but a true surface "anatomy," in the sense that the reader is made to appreciate how much of his dissecting-room anatomy can be recalled to him from a study of the surface of the living body, by the use of his eyes and hands. This is the proper way to learn and apply anatomy; the work is indeed full of matter which can be read with pleasure and profit by teacher as well as by student. Much information is here given which is not usually supplied in text-books—for instance, the points of entry of muscular nerves. The figures are excellent, though perhaps rather [illegible]. An admirable book, which will take its place as a standard work on surface anatomy.

PHARMACOLOGY.

A Text-book of Pharmacology and Therapeutics; or The Action of Drugs in Health and Disease. Ninth edition. By ARTHUR R. CUSHNY, M.A., M.D., LL.D., F.R.S., late Professor of Materia Medica and Pharmacology in the University of Edinburgh. Revised by C. W. EDMUNDS, A.B., M.D., Professor of Materia Medica and Therapeutics in the University of Michigan; and J. A. GUNN, M.A., M.D., D.Sc., Professor of Pharmacology in the University of Oxford. London: J. and A. Churchill. 1928. Pp. 743. 24*s.*

AT the conclusion of the preface to the eighth edition of his book Prof. Cushny quoted the farewell verse of "The Schoole of Salerne." "And here I cease to write. . . ." Perhaps at that time he contemplated withdrawing from the task of revising this text-book, successive editions of which have for a quarter of a century played a great part in advancing the knowledge of pharmacology. In any case, the words were prophetic, for since the appearance of that edition we have had to deplore his death.

The task of keeping a text-book alive when the author is dead is not easy. It is even more difficult when he has imbued its pages with a strong personality. But Prof. Edmunds and Prof. Gunn have undertaken the work of revision in a pious spirit, and have successfully maintained the personal and critical outlook which was a valued feature of the work. While the immediate object of this version has been to bring it into line with the tenth edition of the United States Pharmacopœia, each chapter has been revised in the light of the numerous advances of the last few years, and the bibliography has been extended to include all recent important communications. Cushny's "Pharmacology" has been to a generation of students the standard work in the English language, and in its ninth edition should retain its place in popular estimation.

An Introduction to Experimental Pharmacology. By TORALD SOLLMANN, M.D., Professor of Pharmacology and Materia Medica at Western Reserve University, Cleveland, Ohio; and PAUL J. HANZLIK, M.D., Professor of Pharmacology at Stanford University, San Francisco. London and Philadelphia: W. B. Saunders Company. 1928. Pp. 321. 20*s.*

Prof. Sollmann's "Laboratory Guide in Pharmacology," published in 1917, is recognised by working pharmacologists as one of the most useful books of its class. But, from the point of view of the student, it presented certain disadvantages, particularly in the number, complexity, and meagre explanatory discussion of the experiments. Prof. Sollmann has accordingly, in collaboration with Prof. Hanzlik, adapted his previous work to a more definite course of exercises, reduced the number of experiments, and especially in the exercises on animals has expanded the explanations. The authors obviously share a common experience of laboratory teachers—that the more elaborate the experiments set to be performed by students in training the less likely are they to grasp the essential meaning of their practical work. They have, therefore, laid greater emphasis on demonstrations of the more complex experiments on animals, and there can be no doubt that the advantages of this policy greatly outweigh the sacrifice of personal contact.

The first part of the work is devoted to chemical pharmacology, which besides dealing with plant constituents, pharmaceutical preparations, and the subjects of incompatibility, metrology, and prescription writing, contains chapters on the tests for important drugs, chemical antidotes, antiseptics, and the excretion of drugs by man. It deals also in a most interesting way with the more complex problems of absorption and solution affinity, osmotic and colloidal phenomena, hemolysis and agglutination. Practically

Owing to financial stringency, the dental scheme has hitherto been confined to following up the 6- and 7-year olds, but a second dentist was appointed in November and the scheme will be enlarged. Out of 24,000 elementary scholars 6608 were inspected in 1927; 4166 needed treatment, and 59 per cent. requested to be treated at the dental clinic. Among the school service needs mentioned are classes for partially blind children, an open-air school and hospital treatment for cases of nose and throat obstruction. Owing to the difficulty in using X rays for ringworm in very young children, internal treatment by thallium acetate has been tried. The four children, aged from 2 to 4 years, treated by this method were completely cured.

Preston.

Dr. F. A. Sharpe states that the antenatal work gives promise of success. The new patients at the municipal clinic during the last three years numbered 73, 163, and 272 respectively. About 20 per cent. of the births occur in maternity homes, and at each of the two principal ones there is a carefully organised (non-municipal) antenatal centre. The outstanding need is the coördination of the branches of the public health service so that one health visitor may perform all the district visiting in her particular area. Employment was much better in Preston during 1927. Better control is needed for the houses-let-in-lodgings, which include 156 tenancies and house 430 persons. The same comment applies to the 50 permanent vans, housing 124 persons, some of which are arranged in colonies or camps. Of 325 milk samples examined for tubercle 18 gave a positive result. There are only ten cow-keepers in the borough, producing 354 gallons of milk daily. Among these "inside" milch cows two cases of tubercle of the udder and two of other forms were found, and dealt with under the Order.

Influenza was very severe in January and February, and the deaths attributed to it numbered 102. The insurance scheme, by which mothers, when booking midwives, secure medical aid if needed, is on a small scale as yet, but is proving expensive because the doctors are called in to 57·7 per cent. of the cases.

Norwich.

Dr. V. F. Soothill reports that there is a little less unemployment, but that the distress of the last two or three years has necessitated an increased issue of free meals and milk for mothers and children. Some progress has been made with respect to housing. During 1927, 1115 houses were built, including 843 municipal. This makes a total of 3111 new houses since 1918, including those erected for the dishoused inhabitants of slums. Fewer cases of overcrowding are being reported; and progress is being made with three insanitary areas. Dr. Soothill puts in a strong plea for a certain proportion of the council houses with less than three bedrooms. The old houses of Norwich are frequently unsuitable for reconditioning, as they are worn out and badly arranged. The municipal maternity home admitted 223 women for confinement, and its antenatal clinic was attended by 448 expectant mothers. Of 100 samples of milk examined biologically for tubercle one gave a positive result, and the offending cow was traced and destroyed. Uncomplicated cases of scarlet fever are discharged from hospital after four weeks. There were ten notifications of encephalitis lethargica and five deaths. No case of diphtheria has occurred among the hospital staff since immunisation was introduced in November, 1924.

Rotherham.

Dr. W. Barr reports a year of progress. The smoke nuisance is being faced, and the Sheffield and Rotherham Statutory Smoke Abatement Committee is now a going concern. Accommodation for the mentally deficient is rapidly attaining a practical aspect. An orthopædic scheme for children under 5 years is to be linked up with the school medical service. A new maternity and child welfare centre has been opened, and needs ultra-violet apparatus in view of the prevalence of rickets in Rotherham. Other needs are X ray apparatus for the sanatorium and dental treatment for expectant mothers and tuberculous patients. The number of new houses in 1927 was 322, including 260 municipal. Some small improvements have been made in the slums. Dr. Barr draws special attention to the difficulty in getting houses renovated owing to the tenants being in arrears with their rent, and gives many instances of this hardship to owners. There are 30 registered cow-keepers in the borough, and ten milch cows were slaughtered under the Tuberculosis Order. Twenty-seven cases of small-pox were reported with no deaths. Diphtheria became prevalent during the later months of the year. There were 104 cases notified and 17 deaths. The epidemic was associated with three schools in turn. Swabbing was adopted for suspicious children, and the virulence test was found useful. Out of 48 carriers of diphtheroid germs four were found to be harbouring a virulent type. Three were cases of ear discharge, and one a school teacher who was absolutely well. Syringing and gargling with a concentrated solution of magnesium sulphate were thought to be useful in drying up the ear discharge and shortening the carrier stage.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED NOV. 24TH, 1928.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 199 (last week 162); scarlet fever, 2766; diphtheria, 1390; enteric fever, 45; pneumonia, 1092; puerperal fever, 52; puerperal pyrexia, 111; cerebro-spinal fever, 3; acute poliomyelitis, 13; acute polio-encephalitis, 2; encephalitis lethargica, 25; dysentery, 19; ophthalmia neonatorum, 93. No case of cholera, plague, or typhus fever was notified during the week.

The cases of small-pox were notified in the following 18 counties:—London, 5; Chester, 7 (Ellesmere Port and Whitby); Derby, 25; Durham, 31 (of these Jarrow 24); Essex, 4 (West Ham); Lancaster, 23 (of these Mossley 15); Leicester, 11 (county borough 9); Lincoln, Parts of Holland 1, Parts of Kesteven 1; Northumberland, 4 (Newcastle-on-Tyne, Tynemouth, 2 each); Nottingham 5; Peterborough, 4 (county borough); Stafford, 11; Wilts, 11 (Swindon 5, Highworth R.D. 6); Yorks, East Riding 1 (Hull), West Riding 31 (Halifax 17; Pontefract, 5); Glamorgan, 13; Monmouth, 11.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Nov. 27th-28th was as follows: Small-pox, under treatment 18, under observation 4; scarlet fever, 2624; diphtheria, 2093; enteric fever, 18; measles, 76; whooping-cough, 332; puerperal fever, 17 (plus 9 babies); encephalitis lethargica, 73; poliomyelitis, 4; "other diseases," 18. At St. Margaret's Hospital there were 10 babies (plus 5 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox (there was no death from small-pox in the returns for the month of October from areas other than the 107 county boroughs and great towns), no death from enteric fever, 15 (0) from measles, 5 (1) from scarlet fever, 28 (4) from whooping-cough, 34 (5) from diphtheria, 61 (9) from diarrhœa and enteritis under two years, and 49 (9) from influenza. The figures in parentheses are those for London itself.

Stockton-on-Tees reported 3 fatal cases of measles, Liverpool, Hull, and Sunderland 2 each. There were 4 fatal cases of whooping-cough at Liverpool and 3 at Manchester. Diphtheria accounted for 3 fatal cases at Manchester, and diarrhœa for 8 fatal cases at [illegible] Manchester, while 5 at Salford, and 3 each at Leeds [illegible] and the figures for the same week [illegible] Belfast were 6, 2, and 2 respectively. Influenza claimed no more than 2 deaths in any town.

The number of stillbirths registered during the week in the great towns was 260 (corresponding to a rate of 43 per 1000 births), including 49 in London.

Reviews and Notices of Books.

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all the work in this section of the book can be performed by the student, and is well suited not only to give him a clear idea of the chemical and physico-chemical reactions between drugs and living tissues, but also to make him appreciate the application of those facts in practical medicine. The second part of the book is concerned with experimental pharmacodynamics. Here are described all the usual experiments on intact animals and isolated tissues, while consideration is given to the questions of allergy, œdemas, irritative reactions, and the treatment of poisoning. Among the many valuable features of the book are the appendices, which contain full details regarding the arrangement and equipment of a pharmacological laboratory, operative anæsthesia, the methods of administering drugs to animals, and the doses likely to produce specific effects. Other important information includes the schedule of the courses on pharmacology at the Western Reserve and Stanford Universities. These may well startle medical educationists in this country who may be tempted to regard pharmacology merely as an appendage of physiology, since in the universities mentioned 128 hours are taken up with practical pharmacology alone. This is possibly excessive, but the authors of this book make very clear the importance of pharmacology, and of an intelligent appreciation of the action of remedial agents in the practical problems of therapeutics.

NEUE DEUTSCHE KLINIK.

Handwörterbuch der praktischen Medizin. Vol. I. Edited by Prof. Dr. GEORG KLEMPERER and Prof. Dr. FELIX KLEMPERER, Berlin. Berlin and Vienna: Urban and Schwarzenberg. 1928. Pp. 783. M.40.

THIS work is being produced to replace "Die Deutsche Klinik am Eingang des 20 Jahrhunderts," published in 15 volumes between 1900 and 1907 by E. v. Leyden and F. Klemperer. The present authors propose to show in their book what medicine owes to German science; they disapprove of what they call the outcry for less science and more intuition in medicine. There are 122 collaborators, German, Austrian, and Swiss, including Hans Eppinger, H. W. Maier, O. Minkowski, C. v. Pirquet, H. Schottmüller, C. Seyfarth, and F. Volhard, to mention only a few. The arrangement is alphabetical, and the size of the work when complete can perhaps be guessed when it is realised that the sections beginning with "A" occupy 734 pages, or practically the whole of the first volume. An average section occupies 20 pages and has on its last page perhaps 30 references. Too often, however, no bibliography is appended.

Selecting Angina Pectoris as a typical section we find a history of the condition going back to Heberden and Jenner. Clear clinical descriptions are given of the angina of effort or chronic angina and of the angina of myocardial infarction, which is called after Wenckebach acute angina pectoris. The morbid anatomy is given in detail, emphasis being placed upon calcification of coronary arteries, thrombosis of the left descending branch, and also syphilitic mesaortitis blocking the coronary orifices. Myomalacia cordis, thinning and aneurysm of the ventricular wall, hæmopericardium, and circumscribed fibrous scarring of the myocardium are all described. This is followed by a discussion of the clinical complications and mode of exodus. For ourselves we should have liked to see the theory of the aortic origin of angina dealt with more severely; neither can we agree that sclerosis of the thoracic aorta *leads* to cardiac hypertrophy. In precautionary treatment diuretin in doses of 1 g. t.d.s. is recommended. The use of nitrites during attacks is discussed. Surgical intervention, which is described at length, includes paravertebral novocaine or alcohol injection to block the rami communicantes C5 to D4. No mention is made of the various electrocardiographic findings in myocardial infarction.

Sections such as that on the eye changes found in neurology will be much appreciated. It is subdivided into a large number of parts dealing with papillitis, papillœdema, optic atrophy, lesions of the chiasma, disturbances of the central optic connexions, retinal changes, oculo-motor palsies, anæsthesia of the cornea, paralysis of tear secretion, and pupillary changes.

The printing, paper, and binding of the volume are good, but the coloured illustrations and some of the clinical photographs are less perfect than we are accustomed to expect in contemporary German text-books. If ten or more further volumes are to appear we begin to wonder whether such subjects as alkalosis and acidosis appearing in Volume I. will not require revision before the last volume is completed. By the practitioner and other busy men who cannot keep pace with the literature of subjects in which they are interested this encyclopædic production should be welcomed. It would serve its purpose even better if the editors insisted that each contributor should append a bibliography to his section.

LABORATORY EXPERIMENTS IN PHYSIOLOGY.

By W. D. ZOETHOUT, Ph.D., Professor of Physiology in the Chicago College of Dental Surgery and Normal School of Physical Education. London: Henry Kimpton. 1928. With 102 illustrations. Pp. 251. 10*s.* 6*d.*

THIS manual contains a series of experiments carefully selected by an experienced teacher for students in experimental physiology and biochemistry. The working instructions are prefaced by a series of questions with the object of encouraging the student to marshal his theoretical knowledge before proceeding to practical work. The book is well produced and convenient to handle.

THE ESSENTIAL OILS IN THE TREATMENT OF INFECTIONS.

Traitement Biologique des Infections. By Dr. ALBERT JENTZER, ex-Chirurgien en chef du Second Service de Chirurgie à l'Hôpital Cantonal de Genève. Paris: Masson et Cie. 1928. Pp. 424. Fr.80.

THE author of this book claims to have devised a method of treating acute and chronic septic infections which is a great advance on previous practice. For acute infections he uses a preparation of various essential oils and resins which he calls themsaline; for chronic infections a similar preparation containing lipoids called lipodéterpénol. A great deal of work is reviewed in the book and there is an exhaustive bibliography at least as far as concerns the literature of the pharmacology of the essential oils. The description of the properties, compositions, toxicity, and therapeutic actions of the various oils occupies 76 pages. An account of themsaline follows. Its exact method of preparation is not given but the results of its therapeutic application are fully described. The sole contra-indication to its use recognised by Dr. Jentzer is the presence of a lung infection. The part played by lipoids in immunity, certain facts of allergy, and Besredka's work on the rôle of the skin are there reviewed. These chapters really serve as an introduction to that part of the book which deals with the use of lipodéterpénol. This preparation is administered in association with themsaline partly by subcutaneous injection, partly by rubbing it into the skin. Some animal experiments and clinical experiences are cited to prove the efficacy of the method.

It is difficult to form an accurate judgment of the value of the treatment recommended from a perusal of the book. The evidence brought forward is not so striking as might be expected from the claims of the author, and adequate details as to the method of preparing the remedies are lacking. A carefully organised trial of the methods would be [illegible] ary if the efficacy of such treatment were [illegible] rly appraised.

THE LANCET.

NDON: SATURDAY, DECEMBER 8, 1928.

THE KING'S ILLNESS.

E KING'S condition has given cause for grave ety throughout the past week. The infection e lung is of a kind with which medical men become familiar during the last ten years, ing to expect no sudden termination by crisis ny set period of duration. The course often nts phases or chapters of infection varying in ber, and the temperature settles slowly and mittently. A considerable strain on the heart refore involved—the degree of this strain being ed not only by the virulence of the infection by the time it lasts. Now that the illness has d into its third week the clinical picture has ne more complete, and as unfounded conjecture impossible we offer the following information, authorised to say that the essential facts are t.

early as practicable in the illness a blood e was taken and the result was positive, the ism grown being coccal in character. Blood s have shown a leucocytosis of the polymonuclear variety. Radiology has been useful clear pictures were obtained, confirming the al evidence that the lower two-thirds of the lung was the area involved. There is up to the nt time no appreciable pleural effusion, but the e pleurisy described in the bulletins unforely extended to the diaphragm, causing severe which constantly needed mitigation. Attacks onchial spasm have from time to time added difficulties. It will be recognised how importa such an illness it is to save the patient the and tear of pain and distress by promoting hness and sleep, and in this task the best of g has played no small part. Measures immedirected against the infection have taken the of chemical antidote and attempts to raise ity and promote leucocytosis. There is reason k that some control—and perhaps curtailhave thus been secured. At the time of the physical signs in the chest have diminished corresponding local symptoms have improved. , however, still an ebb and flow, and medical not need to be told that the strain on the ple of a severe infection lasting over two nust be an anxious problem, especially in a over 70 years of age. This strain on the d the severity of the general toxæmia are the chief cause of the serious anxiety which eral days continue.

In an illness which pre-occupies the mind of the English-speaking peoples, and has moved the civilised world, the thoughts of many will turn with sympathy to those responsible for HIS MAJESTY'S care. During these troubled weeks they have included Sir Stanley Hewett, Lord Dawson, Sir Humphry Rolleston, Sir Farquhar Buzzard, Dr. L. E. H. Whitby, Dr. Graham Hodgson, Nurse Purdie (Westminster Hospital), Nurse Black and Nurse Davies (London Hospital), and Nurse Gordon (St. Thomas's Hospital). In our hopes for the KING'S recovery the burden of their tasks will not be forgotten.

SURGICAL ACCESS TO THE BRAIN.

THE problem of obtaining easy access to the interior of the skull has become of increasing importance with the modern demand for large openings, into which it shall be possible to replace the bone without fear of risking its vitality. Several questions arise, the first of which is that of access to the skull itself. It is a curious example of the force of tradition that until quite recently it was generally believed that contact with the scalp must be maintained if the blood-supply of a bone flap is to be preserved. In his recent Hunterian lecture, however, Mr. H. S. SOUTTAR made it quite clear[1] that the vascular supply of the bone and the scalp are independent, so that the scalp may be turned down freely without prejudice to the vitality of an osteoplastic flap, which derives its vascular supply entirely from its muscular pedicle. Nothing then stands in the way of that free exposure of the skull which is obviously the first stage towards easy access to the brain. But even when the skull has been freely exposed, the actual division of the bone presents mechanical difficulties of no mean order. With the old methods it involved an expenditure of time and a degree of exertion on the part of the surgeon which only too often left both patient and surgeon physically exhausted, at a moment when the real business of the operation was only about to begin. In recent years this factor in the problem has received much attention, and in an article in our present issue Mr. W. H. OGILVIE describes an ingenious appliance, in which compressed air is used as the motive power to drive a series of drills, saws, and burrs, by means of which the skull may be rapidly opened in *any situation*. As a source of power compressed air possesses the advantage of being cheap, easily obtained, and sterile, whilst there can be no doubt as to the mechanical efficiency of the tools themselves. The most doubtful link in the operative chain is indeed the surgeon himself, who, oddly enough, is *rarely a mechanic*, and does not readily adapt himself to new mechanical methods.

In general terms there are three distinct methods by which the skull may be divided. The first can be carried out with the ordinary appliances of the operating theatre, and consists in cutting a series of holes with a drill or trephine along the intended line

[1] Brit. Med. Jour., 1928, i., 2.

all the work in this section of the book can be performed by the student, and is well suited not only to give him a clear idea of the chemical and physicochemical reactions between drugs and living tissues, but also to make him appreciate the application of those facts in practical medicine. The second part of the book is concerned with experimental pharmacodynamics. Here are described all the usual experiments on intact animals and isolated tissues, while consideration is given to the questions of allergy, œdemas, irritative reactions, and the treatment of poisoning. Among the many valuable features of the book are the appendices, which contain full details regarding the arrangement and equipment of a pharmacological laboratory, operative anæsthesia, the methods of administering drugs to animals, and the doses likely to produce specific effects. Other important information includes the schedule of the courses on pharmacology at the Western Reserve and Stanford Universities. These may well startle medical educationists in this country who may be tempted to regard pharmacology merely as an appendage of physiology, since in the universities mentioned 128 hours are taken up with practical pharmacology alone. This is possibly excessive, but the authors of this book make very clear the importance of pharmacology, and of an intelligent appreciation of the action of remedial agents in the practical problems of therapeutics.

NEUE DEUTSCHE KLINIK.

Handwörterbuch der praktischen Medizin. Vol. I. Edited by Prof. Dr. GEORG KLEMPERER and Prof. Dr. FELIX KLEMPERER, Berlin. Berlin and Vienna: Urban and Schwarzenberg. 1928. Pp. 783. M.40.

THIS work is being produced to replace "Die Deutsche Klinik am Eingang des 20 Jahrhunderts," published in 15 volumes between 1900 and 1907 by E. v. Leyden and F. Klemperer. The present authors propose to show in their book what medicine owes to German science; they disapprove of what they call the outcry for less science and more intuition in medicine. There are 122 collaborators, German, Austrian, and Swiss, including Hans Eppinger, H. W. Maier, O. Minkowski, C. v. Pirquet, H. Schottmüller, C. Seyfarth, and F. Volhard, to mention only a few. The arrangement is alphabetical, and the size of the work when complete can perhaps be guessed when it is realised that the sections beginning with "A" occupy 734 pages, or practically the whole of the first volume. An average section occupies 20 pages and has on its last page perhaps 30 references. Too often, however, no bibliography is appended.

Selecting Angina Pectoris as a typical section we find a history of the condition going back to Heberden and Jenner. Clear clinical descriptions are given of the angina of effort or chronic angina and of the angina of myocardial infarction, which is called after Wenckebach acute angina pectoris. The morbid anatomy is given in detail, emphasis being placed upon calcification of coronary arteries, thrombosis of the left descending branch, and also syphilitic mesaortitis blocking the coronary orifices. Myomalacia cordis, thinning and aneurysm of the ventricular wall, hæmopericardium, and circumscribed fibrous scarring of the myocardium are all described. This is followed by a discussion of the clinical complications and mode of exodus. For ourselves we should have liked to see the theory of the aortic origin of angina dealt with more severely; neither can we agree that sclerosis of the thoracic aorta *leads* to cardiac hypertrophy. In precautionary treatment diuretin in doses of 1 g. t.d.s. is recommended. The use of nitrites during attacks is discussed. Surgical intervention, which is described at length, includes paravertebral novocaine or alcohol injection to block the rami communicantes C5 to D4. No mention is made of the various electrocardiographic findings in myocardial infarction.

Sections such as that on the eye changes found in neurology will be much appreciated. It is subdivided into a large number of parts dealing with papillitis, papillœdema, optic atrophy, lesions of the chiasma, disturbances of the central optic connexions, retinal changes, oculo-motor palsies, anæsthesia of the cornea, paralysis of tear secretion, and pupillary changes.

The printing, paper, and binding of the volume are good, but the coloured illustrations and some of the clinical photographs are less perfect than we are accustomed to expect in contemporary German text-books. If ten or more further volumes are to appear we begin to wonder whether such subjects as alkalosis and acidosis appearing in Volume I. will not require revision before the last volume is completed. By the practitioner and other busy men who cannot keep pace with the literature of subjects in which they are interested this encyclopædic production should be welcomed. It would serve its purpose even better if the editors insisted that each contributor should append a bibliography to his section.

LABORATORY EXPERIMENTS IN PHYSIOLOGY.

By W. D. ZOETHOUT, Ph.D., Professor of Physiology in the Chicago College of Dental Surgery and Normal School of Physical Education. London: Henry Kimpton. 1928. With 102 illustrations. Pp. 251. 10*s.* 6*d.*

THIS manual contains a series of experiments carefully selected by an experienced teacher for students in experimental physiology and biochemistry. The working instructions are prefaced by a series of questions with the object of encouraging the student to marshal his theoretical knowledge before proceeding to practical work. The book is well produced and convenient to handle.

THE ESSENTIAL OILS IN THE TREATMENT OF INFECTIONS.

Traitement Biologique des Infections. By Dr. ALBERT JENTZER, ex-Chirurgien en chef du Second Service de Chirurgie à l'Hôpital Cantonal de Genève. Paris: Masson et Cie. 1928. Pp. 424. Fr.80.

THE author of this book claims to have devised a method of treating acute and chronic septic infections which is a great advance on previous practice. For acute infections he uses a preparation of various essential oils and resins which he calls themsaline; for chronic infections a similar preparation containing lipoids called lipodéterpénol. A great deal of work is reviewed in the book and there is an exhaustive bibliography at least as far as concerns the literature of the pharmacology of the essential oils. The description of the properties, compositions, toxicity, and therapeutic actions of the various oils occupies 76 pages. An account of themsaline follows. Its exact method of preparation is not given but the results of its therapeutic application are fully described. The sole contra-indication to its use recognised by Dr. Jentzer is the presence of a lung infection. The part played by lipoids in immunity, certain facts of allergy, and Besredka's work on the rôle of the skin are there reviewed. These chapters really serve as an introduction to that part of the book which deals with the use of lipodéterpénol. This preparation is administered in association with themsaline partly by subcutaneous injection, partly by rubbing it into the skin. Some animal experiments and clinical experiences are cited to prove the efficacy of the method.

It is difficult to form an accurate judgment of the value of the treatment recommended from a perusal of the book. The evidence brought forward is not so striking as might be expected from the claims of the author, and adequate details as to the method of preparing the remedies are lacking. A carefully organised trial of the methods would be necessary if the efficacy of such treatment were to be properly appraised.

authorities themselves, if framing assessments unaided, would have behaved with greater sympathy.

Finally, if all else fails, if the hospital is heavily assessed and if all appeal and argument have been in vain, there is yet one possibility left. By virtue of Section 131 of the Public Health Act of 1875 an English local authority can, for the purpose of providing hospital accommodation for its district, enter into agreements with the managers of hospitals. Section 64 of the Public Health Act of 1925 extends this power to include the making of reasonable subscriptions or donations to a voluntary hospital "if the local authority are satisfied that by so doing they will maintain or extend or increase the efficiency of hospital accommodation for the sick inhabitants of the district." The expenditure under this 1925 provision is limited to a penny rate, but it seems that this limit has not been approached. A memorandum attached to Mr. ORDE's report estimates that in the past our hospitals have received by way of preferential rating approximately £250,000 per annum, whereas, if they received subscriptions or donations up to the full limit of the penny rate, they would receive approximately a million pounds.

HENRY HILL HICKMAN.

ON April 2nd of next year falls the centenary of the death of one who, in his own way, may almost be called a martyr to science. HENRY HILL HICKMAN died at the early age of 30, broken-hearted at his failure to obtain any support for nitrous oxide anæsthesia. He was born in 1800 at Lady Halton, near Bromfield in Shropshire, qualified M.R.C.S. in 1820, and practised at Ludlow. Soon afterwards he began a series of experiments on animals with a view to rendering them unconscious before an operation. He first produced semi-asphyxiation by the exclusion of atmospheric air and next rendered dogs insensible by nitrous oxide and carbonic dioxide gases. While they were unconscious he excised their ears and amputated their legs, and then dressed the wounds and noted the time they took to heal. Encouraged by the success of these experiments, in 1825 he removed to Shifnal and endeavoured to demonstrate the results of his investigations to his medical brethren, but they received his views with derision and condemned them as dangerous and useless. As the medical press refused to publish the results of his experiments he made them known in 1824 in a letter to a sympathetic layman, Mr. T. A. Knight, of Downton Castle, who had them printed as a pamphlet. Unable to experiment, as he hoped, on a human subject in England, he decided to lay the matter before the physicians of France, and with that object he petitioned King Charles X. to be allowed to perform his experiments before the leading medical men in Paris. In his letter he alludes to his "discovery" as one he had "entirely originated" himself, and by means of which he was "able to produce insensibility by the introduction of certain gases into the lungs." The letter was referred to the Royal Academy of Medicine, who considered it at a meeting on Oct. 21st, 1828, and selected Mr. Girardin to report on the matter. A committee was appointed to consider the subject, and although the announcement of Hickman's discovery caused a sensation it was received with contempt by the members, with the exception of Baron Larrey, who offered himself for the experiment. Nothing further was done in the matter, and it was allowed to drop. Hickman, who had gone to Paris, was grievously disappointed and died shortly after his return to England.

It was another 30 years before nitrous oxide anæsthesia was taken seriously, and it is amusing to read in THE LANCET of 1868 the reports of meetings and demonstrations and the varied opinions expressed. The seed sown in France by Hickman may have borne some fruit, for it was Dr. T. W. Evans, of Paris, who brought the new anæsthetic to London. 24,000 cases were already on record in America, and to these Dr. Evans added another 1000. He administered gas to 11 patients at the Dental Hospital, Soho-square, on March 31st, to several patients at the house of Mr. Hepburn next day, and to eight more patients at the Dental Hospital on April 2nd. On April 6th Mr. Underwood brought these experiments to the notice of the members of the Odontological Society of Great Britain.[1] So enthusiastic was Dr. Evans that he left the sum of £100 to the Dental Hospital to investigate this anæsthetic, or—if it did not prove satisfactory—any other method of relieving the pain of minor operations. A committee of the society was appointed to investigate the matter, and reported in December[2] to a crowded meeting. The advantages put forward for nitrous oxide anæsthesia were the rapidity of its action and of the patient's recovery, and there appeared to be no ill-effects and no contraindications to its use. Its expense, the difficulty of preparing and transporting it and the complicated apparatus necessary for its administration constituted, however, a grave list of objections. Our considered opinion was guarded, but not so gloomy as that of the President of the Medical Society, Dr. B. W. Richardson, who was at pains to assure his audience that nitrous oxide was one of the "best known, least wonderful, and most dangerous of all substances that had been applied for the production of general anæsthesia."[3] "The administration of laughing gas," remarked our representative at that meeting, "is becoming a pastime for amateurs," and a most unsuitable pastime he certainly regarded it.

Through all this excitement Hickman was forgotten, and it was not until 1912 that his memory was revived by Mr. C. J. S. Thompson, for many years curator of the Wellcome Historical Medical Museum.[4] A hundred years too late to save him disappointment and despair, his countrymen seek to do him honour. It is proposed to renew his tombstone, to place a memorial tablet in Bromfield Parish Church, to procure a portrait for the Royal Society of Medicine, and—if funds permit—to establish a Hickman Prize for original work in anæsthesia. The committee consists of Lord Dawson (chairman), Sir StClair Thomson (vice-chairman), the Editors of the *British Medical Journal* and *The Lancet*, Dr. Dudley Buxton, Dr. H. R. Spencer, Dr. Z. Mennell, Rev. Prebendary W. Joyce, Mr. C. J. S. Thompson, Mr. Ashley Daly, and the secretaries, Dr. W. J. McCardie and Dr. Cecil Hughes. The fund will remain open until the end of January, and subscribers will then be consulted by the committee on the disposal of the fund. Subscriptions of any amount up to two guineas should be sent to the hon. treasurer, Mr. V. Warren Low, 76, Harley-street, W. 1.

[1] THE LANCET, 1868, i., 481.
[2] Ibid., 1868, ii., 779.
[3] Ibid., 1868, i., 287.
[4] Brit. Med. Jour., 1912, i., 813.

of section, and joining these up by means of a hand saw, a Gigli saw, or some variety of cutting forceps. In the second method a powerful electric motor is used to drill the holes and to join these up by means of a circular saw, or some form of burr such as that used by DE MARTEL. The third consists in the use of an entirely specialised appliance. While the first of these methods has the advantage of simplicity it is necessarily somewhat rough and crude, and it demands from the surgeon a degree of exertion which may spoil his touch for the delicate work to which it is only a prelude. It is, however, the method at present in general use. For the second method many excellent motors are now on the market, in which it is possible to sterilise all the parts with which the surgeon comes in contact, and in which he can control the speed to suit his requirements—two essentials for satisfactory work in this difficult region. Such motors, however, are expensive and cumbersome and will only be found in large institutions, so that the peculiarities of English practice render their use difficult in a surgeon's private work. A portable apparatus, readily sterilised in its entirety, which could be worked by hand without undue exertion, would be a real boon to the surgeon. Such an apparatus has been devised by Mr. SOUTTAR and is now coming into general use. The principle on which it works is the novel one of securing a steel peg in the skull at the centre of the proposed flap and using this as a fulcrum round which can turn a powerful lever carrying a cutting tool. The cutting tool is a narrow chisel such as is used by turners for parting their work, and it cuts in the skull a narrow circular channel with extreme precision. The groove is cut on a bevel, and one advantage of the method is that the bone-flap can be replaced with the accuracy of a ground glass stopper. Naturally, so novel an instrument requires some practice before it can be used with facility, but when this is attained, large bone flaps can be cut with an ease and rapidity hitherto unattained; we have seen a four-inch flap turned down in the temporal region in four minutes without apparent effort on the surgeon's part.

There is no art in which the human factor is more important than in surgery, and it is therefore well that surgeons should have at their disposal a large variety of methods from which to choose. The stock of any instrument-maker will show the efforts that have been made to meet their individual requirements, but we have sometimes wished that surgeons themselves would realise the essentially mechanical nature of some of the problems by which they are faced and the technical skill required to use successfully the elaborate appliances now placed at their disposal. It would be an immense advantage to the student if at some point of his training he were taught something of the mechanic's art, and came to realise the cunning of the hand involved in the dexterous use of even the simplest tool. Whilst we fully recognise the ingenuity of the instruments provided for the surgeons' use, it cannot be disputed that their success must ultimately depend on the skill of the hand which uses them.

THE RATING OF VOLUNTARY HOSPITALS.

THERE was once a time when, for want of an obvious person to be assessed, hospitals were not regarded as rateable. When the law stood thus nobody's sense of justice was offended. In 1875 the House of Lords unfortunately found reasons for holding that rates must be paid on voluntary hospitals as on other premises. This change in the law brought no particular pleasure or profit to anybody. No one has ever wanted to increase the hospitals' burden, and it is strange that Parliament should never have given them exemption from the rates. To-day, when the Government is planning to relieve productive industry, the chance has arisen to include hospitals in the de-rating proposals. For various reasons the idea may not be officially welcome. After a period of preparation and discussion the de-rating scheme with its complicated finance has finally taken shape; rating relief is concentrated upon industrial undertakings, not upon institutions; the preliminary provisions of the Rating and Valuation (Apportionment) Act, passed last summer, dealt with agricultural, industrial, and freight-transport hereditaments only, and we shall no doubt be told that it is too late to introduce a new kind of property into the carefully planned stages of the de-rating programme. Still we trust that the possibility of bringing the hospitals within the scheme will not be set aside without thorough examination.

If this chance fails there are two other possibilities. In the first place, it should be feasible to standardise the rating of hospitals throughout the country upon the lowest and most sympathetic assessment. It is well known that the principles of rating in England have varied greatly in different areas. A greater measure of uniformity was one of the results expected from the Rating and Valuation Act of 1925. By cutting down the number of assessment authorities the Act reduced the chances of local variation; further, by setting up a Central Valuation Board, it was hoped to bring the different areas into line with one another and to secure the adoption of a common practice in assessing particular kinds of property. The Central Valuation Board has no powers of enforcing its views but is merely an advisory or persuasive body. Its opinions about the rating of voluntary hospitals have been expressed; they are printed in an appendix to Mr. R. H. P. ORDE's Ninth Annual Report (for the year 1927) on the Voluntary Hospitals in Great Britain. The Board suggests that rating and assessment authorities should be reminded of the common basis for decision. The practical question in the assessment of property is its value to the hypothetical tenant: what would be the reasonable annual rent if the property were in the market to be let for the purpose for which it is at present used? As the Board points out, the assessment authority ought to consider certain specific points when examining the case of a voluntary hospital. One point is the purpose for which the property is actually used and its fitness for that purpose. Another is the undoubted fact that rating and assessment authorities have in the past made a practice of taking into account the principle that the present occupiers of a voluntary hospital can be regarded as possible tenants only so long as they are able to rely upon voluntary contributions from the general public to enable them to continue the occupation and use of the property for hospital purposes. A third point for the rating and assessment authorities is the consideration of all the responsibilities, conditions, restrictions, and circumstances under which the voluntary organisation continues in occupation of the property. If these three points are borne in mind a heavy assessment should be out of the question. Assessments have, however, in many areas been most oppressive. It may be that, in tackling the task of general re-assessment and re-rating which was imposed by the Act of 1925, the local authorities placed themselves in the hands of experts who thought only in terms of big figures and who paid too little regard to local institutions towards which the local

with the dairy work and by the occurrence on the farm lands subsequently of two cases of diphtheria in patients who, like so many farm labourers' children, were not consumers of fresh milk. At any rate, the facts of this carefully investigated little outbreak are of great interest as a reminder of a mode of milk contamination which had come to be rather discounted.

THE LETTERS OF JOHN RAY.

THE eighty-fourth year of the Ray Society saw the tercentenary of the birth of its eponym. The 114th volume of the proceedings[1] consists of unpublished letters of Ray, and amplifies the two volumes of life and correspondence issued by the society in 1846 and 1848 under the supervision of the then secretary, Dr. Edwin Lankester. Much information has come to light in the past 80 years, and the society is fortunate in having Mr. Gunther's scholarly work as a memorial of Ray's tercentenary. The present series of letters is the outcome of a rediscovery in the Bodleian Library of a number of Ray's letters, addressed for the most part to Aubrey and Lhwyd. The latter was keeper of the Ashmolean Museum, where, before their transference to the Bodleian, these letters were housed; their presence there appears to have been overlooked by Dr. Lankester. Fourteen letters are addressed to Aubrey and 15 to Lhwyd, the dates being 1690 to 1691. In 1890 the Bodleian acquired a further series of 26 letters from Ray to Lhwyd, of dates between 1689 and 1703. Nine letters dated 1670–1693 in Ray's holograph were found in the letter books of the Royal Society. Of the letters issued by Derham in 1718, mainly addressed to Martin Lister, many were not printed in full; the details of personal interest which were omitted have now been supplied. A chronological table of Ray's letters, published in 1848 and in the present volume, shows well how the gaps in the former volume are bridged by the present one. Of the first 19 letters, all addressed to Peter Courthope of Danny, only four are to be found in the 1848 volume. Two short lives of Ray, by Dale and Petiver, are here abridged, and the uncertainty of the exact date of Ray's birth is satisfactorily settled by a facsimile of the record in the parish register of 1627. Some of the letters in the present series are in Latin, but by far the greater number are in English and are extraordinarily interesting; they enable us to form some estimate of the great naturalist, the rectitude of whose character is proved by his refusal to sign the Solemn League and Covenant, which refusal deprived him of his Fellowship at Trinity College, Cambridge. His thirst for information is brought out strongly, as well as his willingness to impart his special knowledge to others.

Ray gives explicit instructions to his correspondents as to how books, plants, &c., are to be sent to him; over and over again he informs them that the Braintree carrier "innes at the Pewter-Pot, in Leadenhall-street, and comes out of town on Friday mornings weekly." His letters contain many shrewd comments on his contemporaries; of Father Kircher he says: "I account him a credulous person, possessed with ye vanity of most of ye religious of his church who delight to tell strange and miraculous tales to amuse and delude ye vulgar." He gives as a reason for not sending Lhwyd a copy of one of his books, "the bookseller concerned in that copy is so stingy and sordid as not to allow me copies to present my friends." In the matter of Dr. Burnet's "Theory of ye earth": "A great deal of stuffe he hathe about the mysticall and allegorical physiology of the ancients, which I understand not, nor I believe himself neither." A little further on he says of the same matter, "methinks his book in many places smell rank of the enthusiast." Some few details of medical interest appear in places. Thus for his diarrhœa he found "a very easy and pleasant medicine to be Naples-bisket boiled in milk." The lost letters of Ray to Lister and Tancred Robinson, 1683–1704, are here epitomised from Dering and a very complete index, with references to the 1848 and 1928 volumes, completes a work which illustrates well the scientific attitude and breadth of mind of one of the greatest English naturalists of all time.

INJECTION TREATMENT OF VARICOSE VEINS.

ON the whole the operative treatment of varicose veins cannot be said to have given good results. Seldom can a really successful issue be predicted; usually surgery does no more than reduce disability, and in the remaining cases there is little or no improvement. The popularity of the various forms of injection treatment is rapidly relegating operative measures to a position of merely historic importance. Of its immediate success there is no doubt, though time alone will show what permanence may be expected. Like other forms of treatment, it is, of course, not entirely devoid of risks, and something may be learned of these from a paper[1] in which McPheeters and Rice review from the literature and from their own experience the complications which may follow. The accidents formerly associated with the method were due to the employment of coagulant solutions or to lack of aseptic precautions, but now a total of 53,000 cases treated by injection has been recorded in the literature, with but seven deaths. Of these fatalities pulmonary emboli were responsible for four, whilst the remaining patients died from septic thrombophlebitis, mercury poisoning, and septicæmia respectively. Three other fatal cases have also been reported, but in these the issue is obscured by the presence of some other disease which might equally have been responsible for death. When septic thrombophlebitis occurs these writers consider it much more likely to be due to the lighting up of a latent phlebitis than to the introduction of organisms at the time of injection. On their showing the published figures indicate an extremely low mortality from injection treatment—a mortality many times less than that associated with operation. Of the less serious local complications sloughing and sepsis should be avoidable with proper technique, and the danger of thrombosis developing in the deep veins of the limb has been proved more theoretical than real. The new treatment is admittedly in its infancy, but the results have been very encouraging. The technique is comparatively simple, serious complications almost non-existent, and with due care a cure can be effected in nearly every case.

THE RODS AND CONES.

SOME experiments carried out by R. S. Creed and Ragnar Granit in the Department of Physiology at Oxford[2] throw some light on the obscure subject of the respective functions of the rods and cones of the retina. According to the "duplicity" theory elaborated by J. v. Kries in 1894 and now widely but not universally accepted, the cones serve for vision in bright light while the rods are part of a different mechanism adapted for vision in twilight. These new experiments have to do with the latency of negative after-images following stimulation of different areas of the retina. As such experiments depend on the interpretation of subjective sensations they can only be carried out by trained observers under rigid precautions. Using small white discs of constant size on a dark ground at varying distance from the fixation-point, these observers found that the latent period before the appearance of the after-image is longest in the centre of the field of vision, shortening rapidly to a point about 2° from the fixation-point, then

[1] [illegible]

[2] [illegible]

Annotations.

"Ne quid nimis."

THE UNITY OF THINGS.

"Principalia non praeter necessitatem multiplicanda sunt." This axiom has held good in the limited sphere of clinical medicine for many generations, and no physician will willingly make two diagnoses where one will serve to cover the observed facts. When it comes to extending the same principle to a number of sciences, or to the whole universe, physician and scientist alike offer a far more cautious allegiance. This generation is experiencing a remarkable swing of the pendulum from the extreme concentration of the last on the bacteriological aspect of disease, which seemed in the first flush of its discovery to offer so easy and satisfactory an explanation. Now epidemiologists have realised that the presence of a "causative" organism does not constitute a diseased individual, much less an epidemic. They find themselves exploring again the ideas of Sydenham, which 30 years ago seemed so quaint. The "epidemic constitution" includes far more than the bacterium and all the complicated reactions of the host; it takes account of winds and waters, of temperature and humidity. Last week we had Mr. Kipling urging a distinguished medical audience—not quite ready yet to take him seriously—to include in their survey of the constitution a scan of the heavenly bodies. Now, in harmony with his concept, comes Sir William Bragg, reminding the audience at the Lloyd-Roberts lecture on Nov. 29th that the essence of Faraday's greatness and the basis of all his discoveries was his absorbing belief in the unity of Nature. From that belief and his singleness of aim to prove the underlying connexion between gravity, electrical magnetism, chemical action, cohesion, light, and heat—to the scientist of his day all isolated forces—we owe the whole electro-magnetic theory of light and "wireless," electroplating, electrotyping, electrolysis, and innumerable other "everyday" processes of this age. Because of the tremendous consequence of Faraday's work upon our modern activities and outlook, his diary has a peculiar interest for men of science and laymen alike. As presented by Sir William Bragg, the day to day record of Faraday's laboratory experiments and results, a million words in all, became a living human document, enshrining the lovable enthusiastic personality by whom it was penned. Faraday would write down, in the neat spidery handwriting of his period, all that he thought he might do, all that he did; his many failures and his rare and thrilling successes. Peculiarly dear to the heart of Sir William Bragg was the little word "but," written in capitals and heavily underlined, which breaks a fortnight's sequence of hundreds of unsuccessful experiments. Using very often the actual materials which Faraday had handled, rescued from cupboards in the Royal Institution, the lecturer repeated before the eyes of his audience the very experiments which had led the great scientist to his epoch-making discoveries. Holding a bar of magnetised iron in his hand, he approached a coil of wire connected to a galvanometer, and everybody in the hall saw its needle quiver. "It looks simple, doesn't it?" said Sir William. "But it moved the world." It was the beginning of the dynamo. The famous "but" referred to the experiment establishing the connexion between magnetism and light, and never was truer prophecy written than Faraday's note in his diary that day. "This fact will most likely prove exceeding fertile and of great value in the investigation of conditions of natural force." This crucial experiment, too, the audience at the Royal Society of Medicine were able to see for themselves. In seeking for a connexion between gravity, on the one hand, and light and heat on the other, Faraday was less successful, and he never knew how hopeless was his quest with the material at his disposition. Many intermediate steps were needed before Einstein could predict the deflection by the sun of the ray of light from a planet. This is the centenary year of the beginning of Faraday's diary, and the entries continue until 1862. Faraday, as Sir William Hale-White pointed out in proposing a vote of thanks to Sir William Bragg, was a great lecturer and a great scientist, yet the world owes less to him for his experiments than for the spirit in which he performed them. The simplicity and single-mindedness expressed in his diary was a part of his whole life. The world of science has still something to learn from his message of unity in Nature.

MILK-BORNE DISEASES.

WITH the general improvement of the cleanliness of dairymen, the large-scale adoption of pasteurisation, and the greater efficiency of the departments responsible for controlling communicable diseases, large and explosive epidemics due to contamination of milk-supplies are now much less common than they were 20 years ago. Nevertheless, milk remains an important channel of infection and, indeed, a more interesting one as the elucidation of its association with epidemics becomes more difficult. Recent work in Denmark [1] and the United States of America [2] on undulant fever and cattle abortion suggests a new line of investigation into grouped cases of obscure febrile disease whose milk-supply may be from a common source. In our issue of Dec. 3rd, 1927, we had occasion to draw attention to the importance of watching the milk-supply in epidemics of poliomyelitis, and the evidence that milk may be implicated is fairly convincing. In recent years the occurrence of milk-borne paratyphoid has received a good deal of prominence, especially since Dr. W. V. Shaw's report [3] to the Minister of Health on the Chorley outbreak of October, 1924, was published. New ideas, however, are not confined to diseases whose association with milk had not hitherto been suspected. The view that milk epidemics were invariably sudden and dramatic in their onset has had to be revised. It has been found that quite elaborate detective work may be needed to extricate milk-borne scarlet fever or diphtheria from the mass of cases ordinarily transmitted in any area, the clue being found in an unusual age-distribution of cases with a common source of milk. In diphtheria, especially, explosiveness is by no means characteristic, and this can be readily understood when the comparatively low degree of infectivity of the diphtheria bacillus in normal times and its destruction in acid media are kept in mind. The outbreak reported on p. 1201 of our present issue is one which might easily have been missed if it had been embedded in a large volume of cases directly infected by air-borne droplets, under which circumstances the age-distribution would have been almost the only incriminating evidence, since the number of cases was so small. The main interest of this epidemic, however, lies in the clinical and bacteriological confirmation of previous evidence that the diphtheria bacillus can live on the raw surface of the ulcers of cow-pox and that it may in this way continuously invade the milk over a period. The epidemic and the epizoötic began and ended about the same time, and unquestionable diphtheria bacilli were isolated from the ulcerated cow's teats. As so often occurs in such investigations, the circumstantial evidence was confused by the presence of a diphtheria carrier who had no direct connexion

[1] League of Nations, Epidemiological Report No. 114, May 15th, 1928.

[2] United States Public Health Service, Report No. 35, Sept. 21st, 1928.

[3] Ministry of Health, Reports on Public Health and Medical Subjects, No. 30. See THE LANCET, July 28th, 1928, p. 180.

with the dairy work and by the occurrence on the farm lands subsequently of two cases of diphtheria in patients who, like so many farm labourers' children, were not consumers of fresh milk. At any rate, the facts of this carefully investigated little outbreak are of great interest as a reminder of a mode of milk contamination which had come to be rather discounted.

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[illegible]

Annotations.

"Ne quid nimis."

THE UNITY OF THINGS.

"Principalia non praeter necessitatem multiplicanda sunt." This axiom has held good in the limited sphere of clinical medicine for many generations, and no physician will willingly make two diagnoses where one will serve to cover the observed facts. When it comes to extending the same principle to a number of sciences, or to the whole universe, physician and scientist alike offer a far more cautious allegiance. This generation is experiencing a remarkable swing of the pendulum from the extreme concentration of the last on the bacteriological aspect of disease, which seemed in the first flush of its discovery to offer so easy and satisfactory an explanation. Now epidemiologists have realised that the presence of a "causative" organism does not constitute a diseased individual, much less an epidemic. They find themselves exploring again the ideas of Sydenham, which 30 years ago seemed so quaint. The "epidemic constitution" includes far more than the bacterium and all the complicated reactions of the host; it takes account of winds and waters, of temperature and humidity. Last week we had Mr. Kipling urging a distinguished medical audience—not quite ready yet to take him seriously—to include in their survey of the constitution a scan of the heavenly bodies. Now, in harmony with his concept, comes Sir William Bragg, reminding the audience at the Lloyd-Roberts lecture on Nov. 29th that the essence of Faraday's greatness and the basis of all his discoveries was his absorbing belief in the unity of Nature. From that belief and his singleness of aim to prove the underlying connexion between gravity, electrical magnetism, chemical action, cohesion, light, and heat—to the scientist of his day all isolated forces—we owe the whole electro-magnetic theory of light and "wireless," electroplating, electrotyping, electrolysis, and innumerable other "everyday" processes of this age. Because of the tremendous consequence of Faraday's work upon our modern activities and outlook, his diary has a peculiar interest for men of science and laymen alike. As presented by Sir William Bragg, the day to day record of Faraday's laboratory experiments and results, a million words in all, became a living human document, enshrining the lovable enthusiastic personality by whom it was penned. Faraday would write down, in the neat spidery handwriting of his period, all that he thought he might do, all that he did; his many failures and his rare and thrilling successes. Peculiarly dear to the heart of Sir William Bragg was the little word "but," written in capitals and heavily underlined, which breaks a fortnight's sequence of hundreds of unsuccessful experiments. Using very often the actual materials which Faraday had handled, rescued from cupboards in the Royal Institution, the lecturer repeated before the eyes of his audience the very experiments which had led the great scientist to his epoch-making discoveries. Holding a bar of magnetised iron in his hand, he approached a coil of wire connected to a galvanometer, and everybody in the hall saw its needle quiver. "It looks simple, doesn't it?" said Sir William. "But it moved the world." It was the beginning of the dynamo. The famous "but" referred to the experiment establishing the connexion between magnetism and light, and never was truer prophecy written than Faraday's note in his diary that day. "This fact will most likely prove exceeding fertile and of great value in the investigation of conditions of natural force." This crucial experiment, too, the audience at the Royal Society of Medicine were able to see for themselves. In seeking for a connexion between gravity, on the one hand, and light and heat on the other, Faraday was less successful, and he never knew how hopeless was his quest with the material at his disposition. Many intermediate steps were needed before Einstein could predict the deflection by the sun of the ray of light from a planet. This is the centenary year of the beginning of Faraday's diary, and the entries continue until 1862. Faraday, as Sir William Hale-White pointed out in proposing a vote of thanks to Sir William Bragg, was a great lecturer and a great scientist, yet the world owes less to him for his experiments than for the spirit in which he performed them. The simplicity and single-mindedness expressed in his diary was a part of his whole life. The world of science has still something to learn from his message of unity in Nature.

MILK-BORNE DISEASES.

WITH the general improvement of the cleanliness of dairymen, the large-scale adoption of pasteurisation, and the greater efficiency of the departments responsible for controlling communicable diseases, large and explosive epidemics due to contamination of milk-supplies are now much less common than they were 20 years ago. Nevertheless, milk remains an important channel of infection and, indeed, a more interesting one as the elucidation of its association with epidemics becomes more difficult. Recent work in Denmark [1] and the United States of America [2] on undulant fever and cattle abortion suggests a new line of investigation into grouped cases of obscure febrile disease whose milk-supply may be from a common source. In our issue of Dec. 3rd, 1927, we had occasion to draw attention to the importance of watching the milk-supply in epidemics of poliomyelitis, and the evidence that milk may be implicated is fairly convincing. In recent years the occurrence of milk-borne paratyphoid has received a good deal of prominence, especially since Dr. W. V. Shaw's report [3] to the Minister of Health on the Chorley outbreak of October, 1924, was published. New ideas, however, are not confined to diseases whose association with milk had not hitherto been suspected. The view that milk epidemics were invariably sudden and dramatic in their onset has had to be revised. It has been found that quite elaborate detective work may be needed to extricate milk-borne scarlet fever or diphtheria from the mass of cases ordinarily transmitted in any area, the clue being found in an unusual age-distribution of cases with a common source of milk. In diphtheria, especially, explosiveness is by no means characteristic, and this can be readily understood when the comparatively low degree of infectivity of the diphtheria bacillus in normal times and its destruction in acid media are kept in mind. The outbreak reported on p. 1201 of our present issue is one which might easily have been missed if it had been embedded in a large volume of cases directly infected by air-borne droplets, under which circumstances the age-distribution would have been almost the only incriminating evidence, since the number of cases was so small. The main interest of this epidemic, however, lies in the clinical and bacteriological confirmation of previous evidence that the diphtheria bacillus can live on the raw surface of the ulcers of cow-pox and that it may in this way continuously invade the milk over a period. The epidemic and the epizoötic began and ended about the same time, and unquestionable diphtheria bacilli were isolated from the ulcerated cow's teats. As so often occurs in such investigations, the circumstantial evidence was confused by the presence of a diphtheria carrier who had no direct connexion

[1] League of Nations, Epidemiological Report No. 111, May 15th, 1928.

[2] United States Public Health Service, Report No. 38, Sept. 21st, 1928.

[3] Ministry of Health, Reports on Public Health and Medical Subjects, No. 30. See THE LANCET, July 28th, 1928, p. 180.

with the dairy work and by the occurrence on the farm lands subsequently of two cases of diphtheria in patients who, like so many farm labourers' children, were not consumers of fresh milk. At any rate, the facts of this carefully investigated little outbreak are of great interest as a reminder of a mode of milk contamination which had come to be rather discounted.

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[1] [illegible]

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The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XIV.

THE DETERMINATION OF THE PRESENCE AND SIGNIFICANCE OF REDUCING SUBSTANCES IN URINE.

By E. C. Dodds, M.D., Ph.D., M.R.C.P. Lond.,
PROFESSOR OF BIOCHEMISTRY, UNIVERSITY OF LONDON.

I.*—The Practitioner's Results.

The question as to whether urine contains sugar or not is one which seems to present very great difficulties to practitioners. Nearly every student up for final examinations can answer correctly the question: "How would you determine the nature of the reducing substance in the urine?" But his knowledge must be mainly theoretical, because, when he meets such a problem in practice, he usually sends the urine to the laboratory asking the biochemist to find out whether the offending substance is glucose or not.

In attacking this problem there are two main avenues of approach. Firstly, the academic or examination method, which consists of giving a list of the possible reducing substances in urine. Starting with glucose, the list wanders on through excess of uric acid and creatinin to glycuronic acid, lactose, and finishes up triumphantly with homogentisic acid. The methods for differentiating between this imposing list are usually very complicated, and one of the most popular among students up for examinations is to prepare an osazone of the sugar and to take its melting-point. Any more unpractical and unsuitable method for the ordinary person could not possibly be imagined. The melting-points of the osazones of the normal sugars are very close, and before the analyst could obtain anything like the theoretical figures many purifications and recrystallisations would have to be done.

The Use of Benedict's Solution.

The second way of approaching this problem is from the practical standpoint, and the most important factor in obtaining the correct answer is to use the right type of copper solution for testing the reduction power of the urine. This is not Fehling's solution. I say this not out of any disrespect for Fehling, or with any lack of appreciation of the pioneer work that he did half a century ago. It is merely meant to indicate that when new, better, and simpler methods are available, it is a mistake to adhere to the archaic. The solution used should be Benedict's solution, which can be bought or can be made up in the following way.

Dissolve 173 g. of crystallised sodium citrate and 100 g. anhydrous sodium carbonate in 700 c.cm. water, and 17·3 g. fine crystallised copper sulphate in 100 c.cm. water. Pour the copper sulphate solution into the other, and make up the volume to 1000 c.cm.

The method of performing the test is quite standardised, which is not the case with Fehling's test. 5 c.cm. of Benedict's reagent are placed in a test-tube and 8 drops of the suspected urine added; after shaking, the test-tube is either heated in the flame and the contents boiled for two minutes, or else it is placed in boiling water for five minutes. When it has been cooled, the original blue colour of the contents of the tube will be replaced by a brown colour if the reducing substance be a carbohydrate. Various degrees of reduction, such as opalescence and greenish colour, indicate varying quantities of reducing substance present.

Distinction between Glucose, Lactose, and Pentose.

Apart from homogentisic acid, which is so rarely present that it need not be considered, Benedict's solution is only reduced by carbohydrates such as glucose, lactose, and pentose. If there is still any doubt whether the substance is glucose, then a fermentation test can be performed. This is so simple that anyone can do it without elaborate laboratory facilities. All that is required is a little yeast which is made into a thin paste with the suspected urine and placed in a fermentation tube. A similar paste is also made with urine which is known to be free from glucose, and with urine to which glucose has been added, and the three tubes are left in a warm place overnight. The next morning, if the suspected urine contains sugar, gas will be present in the top of the tube and also in the tube containing the positive control, while there will be no gas above the negative control. It must be remembered that the controls are part of the test, since there are some yeasts which will produce gas when glucose is absent, and others which will not ferment sugar.

Provided the instructions are carefully adhered to, there are no fallacies in Benedict's test. The only error which, to my knowledge, has ever occurred in the employment of Benedict's test, arose under very peculiar circumstances. A physician informed me that Benedict's test was quite useless. He had followed out the instructions very carefully, taking 5 c.cm. of the solution and 8 drops of the urine, and on boiling nothing had happened. A urine which he knew to give a very strong reduction with Fehling's solution gave a mysterious white precipitation with Benedict's solution. To those accustomed to laboratory procedures the answer was obvious: he had purchased Benedict's quantitative solution which only gives a reduction when relatively large quantities of glucose are present, and is specially designed so that no reddish-brown colour appears. It is, therefore, important to see that one is working with the correct reagent—namely, Benedict's qualitative solution.

Benedict's reagent is specially constituted so that it will not be reduced by such normal constituents of the urine as uric acid, creatinin, or glycuronic acid. It follows, therefore, that if this solution be used as the test fluid, then practically all the difficulties usually encountered will vanish. A positive reaction with Benedict's qualitative solution indicates the presence of the carbohydrate, and this, in the urine, is only likely to be glucose, pentose, or lactose. A fermentation test will decide definitely whether or not it is glucose, so that in the majority of cases Benedict's test in combination with a fermentation test will be sufficient to indicate the nature of the reducing substance. Should, however, the Benedict test be positive and the fermentation test negative, then it will be necessary to proceed with further reactions.

If *pentose* be suspected, then the urine can be tested by means of Bial's test.

The reagent consists of 1·5 g. orcinol, 500 g. of fuming HCl, and 20–30 drops of 10 per cent. $FeCl_3$ solution; 5 c.cm. of this is boiled in a test-tube and 2 or 3 c.cm. of urine added. When the tube is removed from the flame the solution turns a green colour if pentose is the reducing substance.

If, however, this test is also negative, then lactose must be suspected, and the only certain method of detecting this is to prepare an osazone. This may be done as follows.

About 50 c.cm. of urine are measured out into a test-tube and 1 c.cm. of glacial acetic acid is added. Enough phenylhydrazine hydrochloride as is required to cover sixpence is added, and this is followed by slightly more sodium acetate (about as much as is required to cover ninepence—i.e., intermediate between sixpence and a shilling). The tube is placed in a boiling water-bath and after half hour's heating the contents are filtered and then allowed to cool, when the characteristic crystals separate out.

* Part II. will appear next week.

Quantitative Estimation of Glucose in General Practice.

With regard to the quantitative estimation of glucose in the urine, it is difficult to recommend any simple method. By far the easiest method is to use some form of polarimeter, of which the most simple is the daylight type, the scale being graduated directly in percentages of glucose. It is only necessary to pour the urine into the observation tube and to adjust the lever until both sides of the polarimetric field are of the same tint. The percentage of sugar can then be read off from the scale. The only disadvantage to this method is the initial expense, since the apparatus costs from £5 to £6. When, however, one considers the saving in time, washing up, and the purchase of solutions, it is doubtful whether the instrument is really a costly one. If the urine is very dark in colour, it may be necessary to perform a preliminary precipitation with basic lead acetate solution. This is done by adding one volume of basic lead acetate to four volumes of urine; the mixture is shaken and filtered, and the perfectly clear, colourless filtrate is then poured into the polarimetric observation tube. In this case, of course, it is necessary to add one-quarter of the reading on the scale to allow for the dilution of the original urine.

This method requires no special skill and takes very little time, so that it is eminently suited to the needs of general practice. If, however, it is felt that the initial expense of the polarimeter is too heavy, then one of the volumetric methods may be used. In this case it is recommended that Benedict's quantitative test be employed. The test is performed as follows.

Into a small flask 25 c.cm. of the quantitative solution are pipetted and 3 to 4 g. of anhydrous sodium carbonate are added, the whole being brought to the boil. Urine is added slowly from a burette until the reagent turns from clear blue to a bluish-white opalescence, when the urine is added still more slowly until the colour is completely gone. This preliminary titration gives some idea of the concentration of the sugar, and on the knowledge thus obtained a second titration is performed with the urine diluted so that about 10 c.cm. will reduce the reagent. Quite a simple calculation will give a fairly accurate result. The most important point in performing this test is to run the urine into the boiling reagent at the same rate each time so that the error is constant throughout a series of titrations.

The tests set out above should rob the problem of its terrors. Very difficult cases rarely arise, and after many years of experience in the large routine of a chemical laboratory I can only recall some half-dozen instances when more than ordinary knowledge and care was required to ascertain the nature of the reducing substance. When, however, the nature of the substance is clear, there remains the problem of estimating the clinical significance of the presence in the urine of any one of the sugars in small or in large quantities.

The most important fact to realise is that the odds are in favour of a reducing substance in the urine being glucose, and that really atypical forms of reduction are usually due to such mundane factors as dirty test-tubes or inaccurately made-up test solutions.

HOSPITAL SAVING ASSOCIATION.—There are now [illegible] contributors, and the [illegible] at the rate of £[illegible]. During the 12 months covered by the annual report the cooperating hospitals [illegible] Hospital Association patients, of whom 21,787 were [illegible]. The total payment for [illegible] to hospitals and boards of guardians was £175,[illegible]; [illegible] £[illegible]. At £[illegible] [illegible] increased [illegible] the previous year.

LONDON PLAYS HOSPITAL PATRONAGE.—Last week [illegible] York had [illegible] of as [illegible] the hospital in [illegible] to [illegible] [illegible] hospitals [illegible] [illegible] hospitals [illegible] [illegible] [illegible]

edges, the base being covered with a loose slough which, when removed, caused bleeding. The ulcers were approximately 1 inch across as a maximum and varied in length from 1–2 inches.

Bacteriological Investigation.

Swabs labelled 1–6 were taken from the sores on the udders of six cows. Cultures were made on serum. Those from swabs 2 and 5 showed typical diphtheria bacilli mixed with a profuse growth of Gram-positive cocci. With a view to isolating the bacilli, subcultures were made, but without success. Also, swabs were again taken on Oct. 5th from cows 2 and 5, but the second swabs showed no typical diphtheria bacilli. By this time the lesions had almost healed and the epidemic of cow-pox had practically come to an end. Cultures 2 and 5 were tested for virulence by making a suspension in saline and injecting 0·4 c.cm. into one guinea-pig and 0·6 c.cm. with 300 units of antitoxin into another. Culture 2 proved to be virulent, the unprotected animal being found dead at the end of 40 hours. No. 5, in which the diphtheria bacilli were not numerous, failed to kill. Cultures were made from the local lesion of the guinea-pig that died and a pure culture obtained. The virulence of this was tested in the same way as the primary mixed culture, the unprotected animal dying in under 40 hours. The post-mortem examinations showed local œdema, fluid in the serous cavities, and very congested suprarenal bodies.

Discussion.

The isolation of virulent diphtheria bacilli from similar lesions of cows' udders has been reported by Dean and Todd [1] and by Ashby.[2] In Dean and Todd's case experiments were made on calves with a view to finding how the ulcers were related to cow-pox on the one hand and to diphtheria on the other. They transmitted the lesions to vaccinated and unvaccinated calves, but were not able to demonstrate diphtheria bacilli in any inoculated animals. They were not able to infect calves with the virulent diphtheria bacilli isolated from the original case. These observations make it clear that ulcers on cows' udders may become infected with virulent diphtheria bacilli, but that this infection is accidental and not the cause of the ulcers.

In the present instance it is probable that the udder condition was the main source of infection of the milk, although absolute proof is lacking. Searching inquiries failed to associate the farmer's daughter (who was found to be a carrier) with the milking operations, and it seemed to be certain that she never had occasion to be in contact with any of the milkers. The precise way in which the cow-pox lesions became infected with diphtheria bacilli remains, therefore, unascertained. There had been no history of sore-throats amongst the milkers or farm hands and swabs from their throats gave negative results. It is possible, however, that one of them, although negative at the swabbing on Sept. 27th, was really a carrier of virulent diphtheria bacilli and responsible for the infection of the teat ulcers, and it is most likely that this person was either the father of the two children who sickened later or another cowman who lodged with them.

The interest of this outbreak lies in the demonstration of virulent diphtheria bacilli in a pathological lesion affecting the udders of cows, milk from which was known to have transmitted diphtheria. It is clear that in investigating outbreaks of milk-borne diphtheria local pathological conditions in the cows concerned should constantly be looked for, and, if discovered, should be fully explored by bacteriological methods.

We are indebted to Dr. Ralph M. F. Picken, medical officer of health, Cardiff, at whose suggestion the udders were swabbed, for his kind permission to publish these notes.

[1] Dean, G., and Todd, C.: Jour. Hyg., 1904, ii., 194.
[2] Ashby, A.: Public Health, 1906, xix., 145.

GENERAL MEDICAL COUNCIL.

WINTER SESSION, 1928.

PENAL CASES.

TUESDAY, NOV. 27TH.

IN accordance with custom, penal cases were heard in public and the Council deliberated on their findings in camera.

Reported by the Dental Board of the United Kingdom.

The Case of Joseph Jennings, registered as of 12, Market-street, Lurgan, "Dentist, 1921." This practitioner had appeared before the Board for persistent canvassing, in spite of a warning issued to him early in the year. The respondent did not appear in answer to his notice. The Council directed that his name be erased from the Register.

ADJOURNED FROM NOV. 24TH, 1927.

The Case of John Joseph Macabe, registered as of 58, Brunswick-street, Chorlton-on-Medlock, Manchester, M.B., B.Ch. 1918, N.U. Irel. This respondent had been convicted before magistrates of assault on one occasion and of drunkenness on four occasions, but the Council had postponed judgment for a year. Mr. Macabe was not present, and a letter from him was read by the Council's solicitor excusing himself on the ground of ill-health and enclosing testimonials to his sobriety and general good behaviour since his appearance before them. The Council, having considered this evidence, decided not to erase his name from the Register.

The Case of John McGhee, registered as of Station-road, Galston, Ayrshire, M.B., Ch.B. 1923, U. Glasg., who had been convicted before magistrates on two occasions of driving a motor-car to the public danger and once of being drunk in charge of a motor-car. The Council had postponed judgment for a year. The respondent appeared, and the Council's solicitor read testimonials furnished by him concerning his character and conduct during the period of probation. The Council did not see fit to erase his name from the Register.

ADJOURNED FROM MAY 28TH, 1928.

The Case of Robert Louis Portway, registered as of Flat 3, 80, Long Acre, W.C. 2, M.R.C.S. Eng. 1916, L.R.C.P. Lond. 1916, D.P.H.R.C.P.S. Eng. 1921, who had been convicted before magistrates once of drunkenness and once of drunkenness in charge of a motor-car. The Council had postponed judgment until their November session. Mr. Portway attended in answer to his notice, and the Council's solicitor read letters testifying to his good conduct in the interval; the Council did not see fit to direct the erasure of his name.

NEW CASES.

Drunkenness in Charge of a Motor Vehicle.

The Case of Bertie Edward Acland, registered as of 19, Sandown-road, Seaforth, Liverpool, M.B., Ch.B. 1924, U. Liverpool, who was summoned to appear before the Council on the following charge: "That he was convicted at the Hanley Petty Sessions of the following misdemeanours, viz.:—

(1) On July 22nd, 1926, of being drunk in charge of a motor-car, and was fined £10 and witness fee £1 1s., or two months' imprisonment in default; and (2) on Oct. 2nd, 1928, of being drunk in charge of a motor-car, and was fined £20 and witnesses' fees £2 1s., and was disqualified for holding a driving licence for two years.

Dr. Acland was represented by Mr. B. de H. Pereira, counsel, instructed by Messrs. Le Brasseur and Oakley, on behalf of the London and Counties Medical Protection Society. The Council's solicitor laid the facts before the Council and read extracts from the proceedings before the magistrates. Respondent's adviser pointed out that respondent had already undergone severe punishment in the publicity which

these two cases had excited and in the loss of his driving licence for two years; he tendered on behalf of his client a solemn assurance to abstain altogether from alcohol in the future. The Council, considering this undertaking, postponed judgment for one year, subject to the usual condition that the respondent should before that time send to the Registrar names of some of his professional brethren who might be willing to testify to the correctness of his habits and conduct in the interval.

Alleged Abuse of Professional Relationship.

The Case of Arthur Fitzwilliam Comyn, registered as of White House, Ladies Walk, Hythe, M.R.C.S. Eng. 1907, L.R.C.P. Lond. 1907, M.B., B.Chir. 1910, U.Camb., who appeared on the following charge:—

That, being a registered medical practitioner, you abused your position by committing adultery with Violet Ella Gertrude Parsons, a married woman, with whom you stood in professional relationship, of which adultery you were found guilty by the decree of the Probate, Divorce, and Admiralty Division (Divorce) of the High Court of Justice, dated Dec. 9th, 1927, and made absolute on June 18th, 1928, in the case of Parsons v. Parsons and Comyn, in which you were the co-respondent. And in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect.

Dr. Comyn, who attended in answer to his notice, was represented by Mr. G. R. Blanco-White, instructed by Messrs. Reed and Reed.

The Council's solicitor, in laying the facts before the Council, remarked that adultery up till 1923 was admitted, and that since that time Mrs. Parsons had not been living in the same town as the respondent. The lady had been married in 1916, and the first child was born in 1918. Her husband, an officer in the mercantile marine, had been a good deal away from home, and they were a strangely ill-assorted pair. In 1920 the second child was born. In 1923 Mr. Parsons had come to England on leave, and, in consequence of a communication from his mother-in-law, had gone to Hythe to interview respondent. Staying the night in his own home, he had found letters from respondent to his wife, and had filed divorce proceedings, obtaining a decree *nisi* in 1927, made absolute in June, 1928. Although the adultery had been terminated for five years, the case had only just come to the notice of the Council. The Council's solicitor read a number of the letters, which were very numerous, pointing out that the couple had had constant quarrels. He produced the birth certificate of the second child, Patrick Miles Parsons, in March, 1922, and the death certificate, dated three weeks later and signed by Dr. Comyn. This, he submitted, constituted proof of professional relationship with Mrs. Parsons and her child. He called Mr. Shaw, the husband's solicitor, who gave formal evidence on the divorce proceedings. Cross-examined, witness stated that no complaint had ever been made that an alleged professional relationship had aggravated the offence of adultery. No evidence was offered that any professional services had been received. If the plaintiff had wished, he could have cited other co-respondents.

Dr. Comyn, giving evidence on his own behalf, stated that he had been in practice in Hythe since 1912. He was still living with his wife and his four children. He had met Mrs. Parsons first in August, 1914, when she was living with her parents. In 1920 he had met her again, and saw her a great deal until May, 1923. His relations with her had been social and not professional, and he had never been engaged as her doctor or her husband's doctor. He did not deny adultery, but it was only after he had confessed that relationship that he had treated both her and her children with no idea of being paid for it. He had never met Mr. Parsons except on [illegible] when the latter had called upon him at his house. He had never been employed by or consulted by Mrs. Parsons's father. She had been on bad terms with her husband. Before her last [illegible] in August 1923, she had [illegible] with [illegible] and helped him with clerical work. A midwife had been present at the birth, and respondent had been present because Mrs. Parsons had wanted him and would not have anyone else. He had taken no part in the delivery. She had borrowed money in the same way as she had given clerical help—as a friend. In May, 1923, he had undergone an operation for appendicitis and had not seen her since.

Cross-examined, he admitted that Mrs. Parsons's father had asked him to keep an eye on her, but not in a medical sense. He had attended the boy Patrick at his death because Mrs. Parsons had asked him to. He had signed the death certificate. As far as he knew she had had no other medical attendant. He had used an expression in one of his letters: "I shall have to give up going professionally," meaning that they were not going to be friends any longer, and that therefore he would not see her in the professional capacity. There had never been any question of his sending in a bill, but if he had, no doubt her relatives would have paid it. Questioned by the President, he admitted that he had signed the death certificate in his professional capacity, although he had attended her as a friend. He had only drifted into attending her because he was her friend. In answer to the Legal Assessor, he admitted having given her advice about her children's whooping-cough, but said he had not seen much of them, as they were very healthy.

Colonel J. H. Hannay gave evidence that the respondent and Mrs. Parsons's family had been on social terms in 1921, and Mrs. Caroline Bullock testified that she had introduced Dr. Comyn to Mrs. Parsons's parents at Hythe in 1914, and that they were then "in and out of her house all day long." Although he was "the" doctor of Hythe, he had never attended her family; they were a very healthy family.

The Council found that the facts were not proved to their satisfaction.

WEDNESDAY, NOV. 28TH.

Association with a Self-Advertising Clinic.

The Case of George Bidie, registered as L.R.C.P., F.R.C.S. Edin., M.R.C.P. Lond., M.D.U. Edin., and of *Mrs. Mary Joseph O'Flynn*, registered as M.B., B.Ch., N.U. Irel. The charge upon which these practitioners had been summoned before the Council was as follows:—

That, being a registered medical practitioner, you have (1) associated with and/or been employed by an institution called "Alpine Sunray Treatments" which advertises for the purpose of obtaining patients; (2) that you have either directly or indirectly advertised and/or acquiesced in the publication of advertisements for the purpose of obtaining patients with a view to promoting your own professional advantage. And that in relation thereto you have been guilty of infamous or disgraceful conduct in a professional respect.

The complainants were the Medical Defence Union, *represented* by Mr. O. Hempson. Lieut.-Colonel George Bidie, who appeared in answer to his notice, was assisted by Mr. Pereira, for the London and Counties Medical Protection Society. Mrs. O'Flynn did not attend, and the Council's solicitor reported that he had been unable to find her address and that she was at that moment seriously ill. The President ordered her name to be struck out of this case.

Mr. O. Hempson said that he proposed to suggest nothing to the detriment of Dr. Bidie, and that his society were merely seeking adjudication. The profession were possibly in doubt as to the proper meaning of the Warning Notice, and the Medical Defence Union had often been consulted on the extent to which a practitioner might associate himself with an institution that attracted patients by means of advertisement, by which he might benefit directly or indirectly. The Medical Defence Union had always held the view that association with an institution providing any kind of medical treatment which advertised for patients was within the scope of the Warning Notice, whether the practitioner received fees for each individual patient or merely profited by the success of the institution.

The "Alpine Sunray Treatment" Clinic, which had been recently formed, had by some extraordinary mischance sent a notice to Mr. Norman King, the Registrar of the Council, at his private address. It consisted of a printed slip entitled on the outside "An Invitation," and contained an account of the foundation of the concern and a laudatory description of its equipment, mentioning also that an experienced consulting physician and a lady doctor were permanently in charge for consultation. It gave a list of the diseases for which artificial sunlight was recommended by the medical profession. The "invitation" was to the recipients and their friends to meet those responsible for the clinic and inspect it, and was clearly from its very form one intended to be received by lay people. Amongst "those responsible" for the conduct of the clinic was, he presumed, Dr. Bidie, as consulting physician. The Registrar had forwarded this pamphlet to the Medical Defence Union, and Mr. Hempson had instructed one of his clerks to write in accordance with the concluding paragraph and ask for the descriptive booklet, which had been received in due course. This had contained the names of the respondent and Mrs. O'Flynn as consultant and assistant physicians, and the manner in which it sought to attract patients to the clinic had been the ground of the present complaint.

Mr. Hempson reviewed the correspondence and interviews which had taken place between the respondent and the Registrar.

According to a letter written on the respondent's instructions by the solicitors to the London and Counties Medical Protection Society, the respondent had, on being approached with an offer of the post of consulting physician, interviewed the Registrar, who had informed him that there was no objection to his taking it provided that he did not circularise or advertise in the public press. Dr. Bidie had received a letter from the managers of the clinic assuring him that their policy would conform to the requirements of the Council, and had thereupon accepted the position, stipulating that he should have an entirely free hand in the selection and retention of the patients and that all nursing and medical matters should be subject to his orders. The patients were to be introduced to him by the secretary and he was then to recommend the appropriate treatment after examination and diagnosis; the secretary was then to make arrangement for treatment and fees. On Sept. 15th Dr. Bidie had received three months' notice on account of the sudden death of the chairman of the institution. He had not been consulted about the framing of the leaflets and pamphlets, but when he had heard of their existence he had approached the managing director and had been assured that none of them were intended for any other purpose than for circulation among the medical profession and personal friends. Dr. Bidie had felt satisfied with this, as he had then no reason to suppose that the assurance he had received, that the concern would conform with the Council's requirements, was not going to be carried out. He had afterwards had doubts about the correctness of the introduction of certain patients, and on writing to the managing director requesting that every patient should be seen by him he had had no reply. The Registrar's letter had been the first intimation respondent had had that circulars were being distributed to the lay public; the London and Counties Medical Protection Society had advised him to dissociate himself from the clinic at once, and this he had done.

A good deal of that letter, said Mr. Hempson, had been written under a misapprehension of the nature of the complaint. The Medical Defence Union were not complaining of respondent's conduct inside the clinic; for all they knew it had been irreproachable. The complaint was against the method by which patients had been attracted to the clinic. The negative attitude the respondent had adopted had not been sufficient, Mr. Hempson submitted, to satisfy his obligations to his profession. The circular had been got up in a form which was almost an insult to the medical profession and most attractive to the layman. He was astounded that the respondent should suggest that it could have any appeal to the profession.

Mr. Hempson then read extracts from the booklet. It began: "This booklet is sent out only in response to inquiries, or the suggestion of someone interested." Those words, presumably put in to anticipate a complaint like the present one, were worthless when coupled with the wording of the original "invitation"; they were merely a form of special pleading. The clinic was described as the most perfectly equipped in Great Britain; the names of the directors and staff were given, respondent's qualifications and professional history appearing in detail. The authorities quoted were non-medical celebrities, and the public were invited to go to the clinic direct. This was the pamphlet respondent had trustingly accepted as only being circulated to the medical profession and friends of those connected with the clinic, and which had found its way to the Registrar. The Medical Defence Union did not suggest that Dr. Bidie was even aware that that method of advertising was adopted, but submitted that when a medical man joined an institution of this kind he ought to make perfectly certain that nothing of the sort could occur. His duty was an active and not merely a passive one.

Mr. Norman C. King stated in answer to cross-examination that Dr. Bidie had come to see him before accepting the position, and had consulted him about the propriety of taking it. He had replied that there was no objection provided the Council's Warning Notice was not contravened, a slightly wider condition than that of mere abstention from circularising laymen or from advertising in the lay press. He could not recall exactly what he had said to Dr. Bidie, as he had seen other doctors lately on the same subject. He had warned him to be particularly careful with lay people, to see that they carried out their undertakings about advertising. Dr. Bidie could not, he admitted, have done more as a preliminary measure. When asked about the line of demarcation between the practice at such institutions as this and that at certain old-established hydropathic establishments, he said that a person might go to a hydro purely for amusement and change or for convalescence, and it might be very desirable to know that there was a doctor in attendance and who he was. This did not apply to the clinic in question. As far as he knew, the first Dr. Bidie had heard of the complaint was on the day when he had sent a representative to the witness to ask if he might consult him about some difficulties in the administration of the clinic; the letter about the complaints had then been awaiting witness's signature. The witness did not think it within his province to suggest the precautions Dr. Bidie should have taken.

Dr. Bidie, giving evidence on his own behalf, stated that he had served in the Indian Medical Service and had heard of the position at the clinic through a highly placed medical friend, who had put him in touch with the chairman of directors. Immediately after going over the clinic and discussing the matter, he had interviewed the Registrar of the Council, whose evidence concerning the conversation he corroborated. On May 18th he had discussed with the board of directors, before taking the appointment, the safeguards which he had considered proper, telling them that he had seen the Registrar. He had stipulated that there should be no advertising, either to the laity or to the lay press, but had said that they might advertise to the medical profession, or publish a notice about the clinic, possibly even with the names of the medical staff, in medical journals. He had asked for a written assurance that the requirements of the Council should be carried out, and had received a letter from the managing director saying: "We assure you that our policy will conform to all the requirements of the General Medical Council, for we consider that their requirements are in every way proper and in the interests of the public." He had also insisted on complete control over the selection and retention of patients, and over the staff and treatment. He had never seen a copy of the pamphlet which had been delivered at the Registrar's residence, and had never heard of its existence until the Registrar had informed his representative of the complaint at about the end of October. He had only heard of the booklet three to four weeks after the clinic had started, when he had seen the rough draft and photo-

for washing out the bladder (if this were necessary) were obtained. Mr. S. T. Irwin showed radiograms of displacement of the upper epiphysis of the femur in a girl of 11 years and 11 months. Correction of the deformity had been obtained by careful manipulation of the joint, with its immobilisation in plaster for three weeks, and a subsequent period of rest in bed, and the result had been excellent, with only a quarter of an inch shortening of the limb and no deformity visible in the skiagram. Dr. J. T. Lewis reported the case of a man, aged 50, who had marked albuminuria and low blood pressure with normal urea excretion, and who developed jaundice and marked enlargement of the liver with loss of weight. The Wassermann test was found to be positive, and after a course of iodides and novarsenobillon the liver regained its normal size, the jaundice vanished, the albumin almost completely disappeared from the urine, and the systolic blood pressure rose from 90 mm. Hg to 135. Prof. Fullerton, Dr. Marshall, Mr. Crymble, Mr. Irwin, Mr. Purce, Mr. O'Doherty, and Mr. McFadden joined in the discussions following these contributions.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Matthews Duncan.

AT the first sessional meeting of the Edinburgh Obstetrical Society Dr. Haig Ferguson gave a presidential address on Matthews Duncan, his predecessor in the chair in the year 1874. After a vivid recollection of his person, Dr. Ferguson dealt with Duncan's early life, and his outstanding career at Marischal College, Aberdeen, where he carried all before him. His relations with Sir J. Y. Simpson were then alluded to, and emphasis was laid on his intimate connexion with the discovery of chloroform. An accurate account of his valuable publications and addresses was given, and extracts from his diary were read which helped those present to realise what a great man Duncan was and how advanced his ideas were. Edinburgh sustained an irreparable loss when Duncan left to take up his appointment at St. Bartholomew's Hospital. In London he enjoyed a wider sphere of work and had full scope for his marvellous gift of teaching the younger generation. But however busy he was in London, he was never too busy to receive old friends from the North, and to enjoy a crack about Edinburgh affairs. Dr. Ferguson concluded his address by emphasising Duncan's directness and simplicity, upheld by a deeply religious conviction. He was not only one of the most famous gynæcologists but one of the great personalities in medical history.

Heredity and Health.

In one of a series of health lectures promoted by Glasgow Corporation and the Burgh Insurance Committee, Prof. F. E. A. Crew, head of the Animal Research Breeding Department, Edinburgh University, gave a crisp statement of the essential problem. It was important, he said, that a family history should be kept. The question of being well-born was quite important, and having been well-born the next matter was to remain well. Children would not remain well if the environment in which they lived was of a kind that was not conducive to the full self-expression of their organic inheritance. For every individual exhibiting defect, there were ten carriers. The problem was to identify and cure the carrier, not the defective. It is good that Dr. Crew has put the matter so clearly. At present the carrier of mental defects cannot be diagnosed, except through an exhaustive family history, or through the progeny. Even then the diagnosis can only be a probability. Obviously, if there are ten carriers for one overt defective, the prevention of the defective may be advisable, but public interest and as well as in his own, [illegible] the problem of mental defectives [illegible] well the real extent of overt defectives for the difficulty.

Child Adoption.

The work of the National Children Adoption Association was warmly commended by Lord Murray, of the Court of Session, at the annual meeting of the Scottish Branch of the Association. He was told, he said, that there were people who withheld their sympathy from this work in the belief that they were smoothing the road and making it easier for back-sliders. This was a danger, but they must meet it and beat it. It was some years since he had publicly advocated legalised adoption, and by that he meant that it would be well to have an Act for Scotland similar to the English Statute. In England legislation had, he thought, wisely not gone the whole length. Adoption had been safeguarded and subjected to judicial regulation, but no provision was made in respect of money inheritance and succession, which had hindered the working of the law in France. Lord Murray's commendation comes with force from one who is an authority on the history and evolution of the law of adoption. The Scottish Association, it should be stated, accepts no child on the adoption list without careful examination of its circumstances and suitability. No child is offered for adoption unless it has passed a severe medical examination. No adopters are accepted until they have furnished the Association with two references proving them to be suitable persons to be entrusted with the care of a child. No money passes between the contracting parties, and the two parties are never in direct contact with each other. Even these precautions are not always enough to prevent subsequent trouble and chagrin; but, in the absence of legislation, nothing better seems possible.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Medico-legal Questions.

At a meeting of the Parliamentary Committee for Criminal Reform some members moved that the courts should be authorised to order the sterilisation of habitual criminals, including not only those guilty of sexual crimes, but also those coming from families in which criminality is hereditary. It was stated that in some of the American States sterilisation of criminals is already in operation and that in Denmark introduction of the system is planned. The Minister of Justice spoke against the motion, saying that a professional criminal could not be dismissed even if sterilised, and that the influence of heredity is not yet sufficiently proved to justify such strong measures. A prisoner's agreement to be sterilised as the price of being dismissed from custody could only be regarded as given under duress. The motion was rejected by the committee.

The case is reported in the daily papers of a murderer at Riga who has been sentenced to death and has petitioned for pardon. The Latvian Government, it is said, is inclined to grant the request on condition that he will agree to being inoculated with leprous bacilli for experimental purposes. The report has caused some astonishment in this country, and a Berlin daily paper has asked the opinion of several medical men. Dr. Burger, chief medical officer to the Ministry of Justice, was of opinion that an agreement by a man sentenced to death and hoping to avoid execution by submitting to an experiment which might later lead to severe illness, mutilation, and death under terrible sufferings could not be considered as given in full consciousness of his fate, and that the proposal must therefore be condemned. Dr. Hoppmann, medical officer to the Moabit Penitentiary in Berlin, said that the man certainly did not know the sufferings which he might later have to undergo if he agreed to inoculation. It would be against the public spirit of justice to pardon a murderer by replacing capital punishment by another but terrible death.

existing examinations. The Council should also consider whether the standard of the examination should not be more clearly defined. For the present, however, the replies were being circulated to the licensing bodies. In May next the Committee proposed to report on how far professional instruction in physics and chemistry in their relation to medicine was being continued throughout the curriculum. After some discussion of detail the report was adopted.

Registration of Indian Students: The Conjoint Board.

In reporting on "Various Matters Remitted to the Education Committee," the President informed the Council that the Conjoint Board in England exempted from pre-registration chemistry and physics those Indian students who could show a pass in the matriculation examination and in the intermediate arts and sciences examination. This enabled them to qualify sooner than their colleagues in India. The Council resolved that the Board be informed that they were not acting in conformity with the requirements of the Council. It was also resolved to inform the Conjoint Board in England that in allowing the medical course to be completed in under five years, they did not satisfy the Council's minimum requirements.

The names of William Birkett, Samuel Theodore Hilton, and Thomas McGowan were restored to the Dental Register.

MEDICINE AND THE LAW.

Death Due to Alcoholism: Reference to Coroner.

DURING an inquest held a few days ago at Westminster Mr. Ingleby Oddie stated that the post-mortem examination had shown the diagnosis to be entirely wrong; death was due to alcoholism. "This is a case," he added, "which should have been reported to me." Deceased was a woman who had lived at an hotel at Monte Carlo until she came to stay at an hotel in the West End of London two months ago. A medical practitioner, giving evidence at the inquest, said he had attended the deceased; he mentioned having called in a second opinion for consultations on two dates in November. Asked by the coroner, "what was the diagnosis?" the witness replied, "I thought latterly she had carcinoma of the liver and heart failure"; he said he knew the deceased was taking alcohol but had never known her take it to excess. "Did not you suspect cirrhosis of the liver?" asked the coroner. "I did," replied the witness, "and I afterwards changed my opinion on clinical grounds." "Why did you not report the case to me?" asked the coroner; "you suspected carcinoma of the liver which was not there; you knew there was cirrhosis, which means drink, and yet you issued a certificate of death without telling me." Later in the case, after a pathologist had described the result of the post-mortem examination and had said that death was due to syncope from cirrhosis brought on by alcohol, the coroner said the law provided that deaths from alcoholism had to be reported to the coroner. This case had not been reported to him and, but for the fact that his officer was an astute officer, the woman would have been buried as having died from carcinoma of the liver.

Mr. Ingleby Oddie is so experienced a coroner that one hesitates to question his observations, if indeed they were correctly reported in this instance. But is it strictly accurate to suggest that a medical practitioner has any obligation to report alcoholism to a coroner? To say to a medical witness, "You issued a certificate of death without telling me," is surely a dubiously phrased complaint. If a practitioner makes an incorrect diagnosis, he cannot escape such blame as the circumstances may warrant. If he knows alcoholism to be a contributory cause of death, he must say so in his certificate. But does the practitioner report directly to the coroner? Regulation 75 of the consolidated code of Regulations dated May 31st, 1927, deals with the cases in which reference must be made to the coroner. One of these is that of "any death which appears to the registrar from the contents of the medical certificate to have been due to . . . alcoholic poisoning." But it is the registrar who refers the case to the coroner. Mr. Ingleby Oddie is, of course, entitled to point out that, because the medical practitioner in the instance under discussion failed to name alcoholic poisoning as a cause or contributory cause of death, therefore the registrar was unable to report the case to the coroner under Regulation 75. Was Mr. Oddie referring to this Regulation? If so, it should perhaps be made plain that the deceased's medical attendant had a duty to certify the cause of death but no duty to report to the coroner.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Medical Certification of Insured Persons.

ON Nov. 30th General R. Mulcahy, Minister for Local Government and Public Health, received a deputation which had been appointed by the Irish Medical Committee to discuss with him the proposal recently made by the National Health Insurance Commission to change the pool area of distribution of remuneration for medical certification from the dispensary district to the county. The deputation, which consisted of Drs. T. Hennessy, R. J. Rowlette, H. J. Raverty, and J. P. Shanley, put before the Minister the reasons which led the committee to decline to recommend the proposal of the National Health Insurance Commission for acceptance by the certifiers. After a long discussion the Minister agreed to defer any change in the present mode of payment until he had had time further to consider the present system as compared with alternatives which might possibly be more administratively sound and more equitable to the certifiers. He commented on the present cost of distributing the £37,000 for medical certification. The cost to the State of medical certification was, he said, one-tenth of the total inclusive cost to the State of National Health Insurance and its administration.

Ulster Medical Society.

The third meeting of the session was held in Belfast on Nov. 29th, with Prof. T. H. Milroy, the President, in the chair. Dr. J. A. Smyth read notes on some interesting cases of nephritis. The first was one which clinically resembled Addisonian anæmia, and showed no definite œdema and only a trace of albumin in the urine. The diagnosis was made by finding that the chloride excretion had fallen to 0·3 g., and post-mortem findings were typical of hydræmic nephritis. The second case was that of a man who died in uræmic coma with a blood-urea content of 363 mg. per cent. and a blood creatinine of 8 mg. per cent., without having any albumin in his urine during the week before death while under observation. A photograph was shown of a man who, in appearance, presented the typical features of hydræmic nephritis, but on examination proved to have nephritis of pure azotæmic type. Dr. Smyth next showed a curve illustrating a marked fall in blood-urea (from 353 to 72 mg. per cent.) in a case of enlarged prostate following the use of a tied-in catheter. A notable feature was the almost negligible fall in blood creatinine, from 5·2 to 4·6 mg. per cent., despite marked improvement in the patient's clinical condition. The last case was that of a woman suffering from a mixed type of nephritis, who had been under observation for three and a half years. At the beginning of this period she had definite albuminuric retinitis which afterwards cleared up; pregnancy caused a considerable further failure of renal functions, which improved on the induction of labour.

Prof. Andrew Fullerton demonstrated by means of anatomical diagrams his method of perineal drainage of the bladder after suprapubic prostatectomy, showing that no injury was caused to the levator ani muscle, while adequate drainage and the ideal route

for washing out the bladder (if this were necessary) were obtained. Mr. S. T. Irwin showed radiograms of displacement of the upper epiphysis of the femur in a girl of 11 years and 11 months. Correction of the deformity had been obtained by careful manipulation of the joint, with its immobilisation in plaster for three weeks, and a subsequent period of rest in bed, and the result had been excellent, with only a quarter of an inch shortening of the limb and no deformity visible in the skiagram. Dr. J. T. Lewis reported the case of a man, aged 50, who had marked albuminuria and low blood pressure with normal urea excretion, and who developed jaundice and marked enlargement of the liver with loss of weight. The Wassermann test was found to be positive, and after a course of iodides and novarsenobillon the liver regained its normal size, the jaundice vanished, the albumin almost completely disappeared from the urine, and the systolic blood pressure rose from 90 mm. Hg to 135. Prof. Fullerton, Dr. Marshall, Mr. Crymble, Mr. Irwin, Mr. Purce, Mr. O'Doherty, and Mr. McFadden joined in the discussions following these contributions.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Matthews Duncan.

AT the first sessional meeting of the Edinburgh Obstetrical Society Dr. Haig Ferguson gave a presidential address on Matthews Duncan, his predecessor in the chair in the year 1874. After a vivid recollection of his person, Dr. Ferguson dealt with Duncan's early life, and his outstanding career at Marischal College, Aberdeen, where he carried all before him. His relations with Sir J. Y. Simpson were then alluded to, and emphasis was laid on his intimate connexion with the discovery of chloroform. An accurate account of his valuable publications and addresses was given, and extracts from his diary were read which helped those present to realise what a great man Duncan was and how advanced his ideas were. Edinburgh sustained an irreparable loss when Duncan left to take up his appointment at St. Bartholomew's Hospital. In London he enjoyed a wider sphere of work and had full scope for his marvellous gift of teaching the younger generation. But however busy he was in London, he was never too busy to receive old friends from the North, and to enjoy a crack about Edinburgh affairs. Dr. Ferguson concluded his address by emphasising Duncan's directness and simplicity, upheld by a deeply religious conviction. He was not only one of the most famous gynaecologists but one of the great personalities in medical history.

Heredity and Health.

In one of a series of health lectures promoted by Glasgow Corporation and the Burgh Insurance Committee, Prof. F. E. A. Crew, head of the Animal Research Breeding Department, Edinburgh University, gave a crisp statement of the essential problem. It was important, he said, that a family history should be kept. The question of being well-born was quite important, and having been well-born the next matter was to remain well. Children would not remain well if the environment in which they lived was of a kind that was not conducive to the full self-expression of their organic inheritance. For every individual exhibiting defect, there were ten carriers. The problem was to identify and cure the carrier, not the defective. It is good that Dr. Crew has put the matter so sharply. At present the carrier of mental defects cannot be diagnosed, except through an exhaustive family history, or through the progeny, [illegible] the diagnosis can only be a probability. [illegible] if there are ten carriers for one overt [illegible] of the defective may be advis[illegible] [illegible] well as in his own, [illegible] of the problem of mental defi[illegible] [illegible] will the [illegible] of overt defec[illegible] the difficulty.

Child Adoption.

The work of the National Children Adoption Association was warmly commended by Lord Murray, of the Court of Session, at the annual meeting of the Scottish Branch of the Association. He was told, he said, that there were people who withheld their sympathy from this work in the belief that they were smoothing the road and making it easier for back-sliders. This was a danger, but they must meet it and beat it. It was some years since he had publicly advocated legalised adoption, and by that he meant that it would be well to have an Act for Scotland similar to the English Statute. In England legislation had, he thought, wisely not gone the whole length. Adoption had been safeguarded and subjected to judicial regulation, but no provision was made in respect of money inheritance and succession, which had hindered the working of the law in France. Lord Murray's commendation comes with force from one who is an authority on the history and evolution of the law of adoption. The Scottish Association, it should be stated, accepts no child on the adoption list without careful examination of its circumstances and suitability. No child is offered for adoption unless it has passed a severe medical examination. No adopters are accepted until they have furnished the Association with two references proving them to be suitable persons to be entrusted with the care of a child. No money passes between the contracting parties, and the two parties are never in direct contact with each other. Even these precautions are not always enough to prevent subsequent trouble and chagrin: but, in the absence of legislation, nothing better seems possible.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Medico-legal Questions.

At a meeting of the Parliamentary Committee for Criminal Reform some members moved that the courts should be authorised to order the sterilisation of habitual criminals, including not only those guilty of sexual crimes, but also those coming from families in which criminality is hereditary. It was stated that in some of the American States sterilisation of criminals is already in operation and that in Denmark introduction of the system is planned. The Minister of Justice spoke against the motion, saying that a professional criminal could not be dismissed even if sterilised, and that the influence of heredity is not yet sufficiently proved to justify such strong measures. A prisoner's agreement to be sterilised as the price of being dismissed from custody could only be regarded as given under duress. The motion was rejected by the committee.

The case is reported in the daily papers of a murderer at Riga who has been sentenced to death and has petitioned for pardon. The Latvian Government, it is said, is inclined to grant the request on condition that he will agree to being inoculated with leprous bacilli for experimental purposes. The report has caused some astonishment in this country, and a Berlin daily paper has asked the opinion of several medical men. Dr. Burger, chief medical officer to the Ministry of Justice, was of opinion that an agreement by a man sentenced to death and hoping to avoid execution by submitting to an experiment which might later lead to severe illness, mutilation, and death under terrible sufferings could not be considered as given in full consciousness of his fate, and that the proposal must therefore be condemned. Dr. Heppmann, medical officer to the Moabit Penitentiary in Berlin, said that the man certainly did not know the sufferings which he might later have to undergo if he agreed to inoculation. It would be against the public spirit of justice to pardon a murderer by replacing capital punishment by a slow but terrible death.

The Morphia Habit.

In one of the Parliamentary Committees a question has been put to the Government as to whether the morphia habit is increasing in Germany. A representative of the Health Office states in reply that for every 100,000 of the population three men and one woman are known to indulge in the habit. The number of patients treated in hospitals and sanatoriums for this condition was 1497 in the period 1911–13, 3084 in 1920–22, 1283 in 1923, and 1623 in 1925. The number of deaths attributed to this form of intoxication was 32 in 1923, 18 in 1924, and 39 in 1925. A total of 2400 kg. of alkaloid imported into Germany is compared with an export of 9520 kg. during the same period, and the question has been raised whether its production should not be limited to the amount consumed. To this suggestion the Government spokesman replied that there is a great need of alkaloids throughout the world, and that only a few countries produced them—namely, Great Britain, Switzerland, France, Germany, and Japan. The matter is regulated by international conventions which make it illegal to use them for purposes other than the strictly medical. The committee eventually adopted a motion that the Government should consider measures to limit the production of alkaloids to the quantity necessary for medical purposes in Germany.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lts. (D.) to be Surg. Lt.-Comdrs. (D.): J. M. Park, J. L. Edwards, and S. E. Brown.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt. S. B. Borthwick to be Surg. Lt.-Comdr.

ROYAL ARMY MEDICAL CORPS.

Maj. P. S. Tomlinson, R.A.M.C., to be Divl. Adjt. 56th (1st Lond.) Div. T.A., vice Maj. A. R. Ross, R.A.M.C., who vacates the appt.

Maj. H. H. Leeson retires on retd. pay and is granted the rank of Lt.-Col.

Capt. A. P. Draper, R.A.M.C., to be Divl. Adjt. 52nd (Lowland) Div. T.A., vice Maj. G. D. Yates, R.A.M.C., who vacates the appt.

Capt. D. J. Batterham retires, receiving a gratuity.

Lts. (on prob.) confirmed in their rank: P. V. MacGarry, J. E. Swyer, and A. McMillan.

Lts. T. S. Torrance and N. R. Rawson to be Capts.

A. D. Briscoe and N. H. Watson (late 2nd Lt. Durham L.I.) to be Lts.

ARMY DENTAL CORPS.

Lt. A. Hughes to be Capt.

TERRITORIAL RESERVE ARMY OF OFFICERS.

Capt. A. S. L. Malcolm, from Active List, to be Capt.

ROYAL AIR FORCE.

Flying Officer R. A. W. Kerr is promoted to the rank of Flight Lt.

Flight Lt. T. J. X. Canton is promoted to the rank of Squadron Leader.

Flight Lt. A. H. Mills (Temp. Capt., General List, Army, Dental Surgeon) relinquishes his temporary commission on completion of service.

RESERVE OF AIR FORCE OFFICERS.

Flying Officer R. G. J. McCullagh relinquishes his commission on completion of service.

DONATIONS AND BEQUESTS.—The late Mr. C. J. Schoonhoven, of Finchley, left some £30,000 to be divided among ten London hospitals at the discretion of his executors.—The late Mr. James Bebby, of New Brighton, left £1000 each to the Liverpool Royal Infirmary, the Liverpool Royal Southern Hospital, the Liverpool David Lewis Northern Hospital, and the Bootle Borough Hospital, in each case for the endowment of a "James and Margaret Bebby Bed."

Correspondence.

"Audi alteram partem."

SHOT IN THE VERMIFORM APPENDIX.

To the Editor of THE LANCET.

SIR,—I have read with much interest the case reported in your last issue by Prof. John Fraser, together with his valuable comments thereon. It has for many years been my practice to remove the appendix in practically every abdominal section I perform for non-urgent conditions, and afterwards to slit it up for examination. On only four occasions have I met with shot in the appendix, and in only one of these had the condition been suspected prior to operation. This was in a youth of 20, who after spending five weeks shooting on his father's estate in Scotland and living largely on game, developed some vague abdominal discomfort for which his medical adviser ordered him to be radiographed. The radiographer reported that there were 15 pellets in the appendix; a second radiogram ten days later showed only nine. Although it was considered quite likely that the pellets might be passed naturally, yet as the youth was about to take up residence abroad appendicectomy was decided upon, and two days later I removed the appendix. It contained nine pellets at its distal end, the mucosa at this region being very definitely reddened; otherwise the appendix was normal, and was free from adhesion.

A consideration of the enormous amount of shot game that is annually consumed suggests that the entry of pellets in the appendix is not a very rare occurrence, and that most of them ultimately escape therefrom and are passed naturally.

I am, Sir, yours faithfully,

Manchester, Dec. 3rd, 1928. ARTHUR H. BURGESS.

To the Editor of THE LANCET.

SIR,—The clinical notes of Prof. Fraser recall a case I saw, I think it was in 1913, of a locally well-known sportsman whose shoot was near Edenbridge in Kent, from whose appendix some 24 shot were removed at an operation by Mr. J. B. Footner, of Tunbridge Wells.—I am, Sir, yours faithfully,

F. THOMPSON, M.R.C.S., L.R.C.P.

Epsom, Dec. 3rd, 1928.

A TUDOR ACT OF INDEMNITY FOR UNQUALIFIED PRACTICE.

To the Editor of THE LANCET.

SIR,—The principal interest attaching to the document found at New Romney is the question of its authenticity. It does not ring true. At no time, so far as is known, has it been possible to inhibit the medical practice of "divers honest persons . . .; whom God hath endued with the knowledge." Medical faculties possessed of extreme repressive powers, even ecclesiastical authorities, have tried in vain to do so. If, then, Henry VIII. found it necessary to protect the self-constituted practitioners of medicine, his Statute must be unique.

The knowledge of the existence of such a document is, however, an old story. Sir D'Arcy Power must have had it before him, in whole or part, 40 years ago, for he quotes some sentences verbatim from it in his "Memorials of the Craft of Surgery" (Cassell and Co., 1886). It is right to add that though he gives no reference to an authority, he appears to accept the document as genuine. The "customable diseases" are, also, well known. "A pin and the webbe in the eye" very commonly go together. Thus Leontes in "A Winter Tale" speaks of "all eyes Blind with the pin and web but theirs." Pin or pane or panne (from *pannus*, a cloth or web) refers

to some opacity in the eye, generally of the cornea; sometimes to cataract, where that was visible from without. Webbe was of similar character and survives in web-eye (pterygium). Morfew, or more properly morphea, was applied to various skin affections, the white variety being identified with leprosy. Saucelim is a variant of saucefleme—i.e., *salsum phlegma*, or salt rheum. Chaucer's Sompnour was afflicted with it, and the poet's description of the disease and its treatment is probably as definite as can be found anywhere.

> That Lodde a fyr-reed cherubynes face,
> For saweflem he was, with eyghen narwe.
>
> Ther was quyk-silver, litarge, ne brimstone,
> Boras, ceruce, ne oille of tartre noon,
> Ne oynement that wolde clense and byte,
> That him might helpen of his whelkes white,
> Ne of the knobbes sittyng on his cheekes.

As to the power vested in the bishops to issue licences to practise and even degrees in medicine, this was common in the Middle Ages, and Henry VIII. in the Act of 1511 was merely following precedent. It may be recalled that a few years ago the suggestion was made that a certain well-known bloodless surgeon should have the custom revived in his favour, and receive the diploma of M.D. from the Archbishop of Canterbury.

I am, Sir, yours faithfully,

Edinburgh, Nov. 28th, 1928. G. MATHESON CULLEN.

To the Editor of THE LANCET.

SIR,—The word "saucelim" should apparently be read as sauce-fleme, or saweflem, a word which was used to signify an eruption of red spots or scabs on the face. There is a reference in Chaucer as follows: "For saweflem he was, with eyes narwe," and many years ago there was a discussion on this word in *Notes and Queries*, and in the editorial footnotes to Chaucer. It is the same as the French *sauce*, Latin *salsum*, and the Greek *phlegma* (cf. phlegmon). In English I suppose it would mean "salty inflammation." The fl may be a compound letter in the ancient script, such as we still use in our small printing type, or else the l has been put erroneously for the compound fl. In the "Index to the Statutes in Force" the Acts are stated as follows:

Surgery.—Prohibition from practising as, in England, unless licensed by bishop; saving of privileges of universities, 3 Hs. c. 11. Saving as to persons treating outward sores by external remedies, 31 Hs. c. 8.

It is the latter Act which is described in the article in THE LANCET of Nov. 24th.

I am, Sir, yours faithfully,

Nov. 30, 1928. BLANCHE.

TONSILLECTOMY OR GALVANO-PUNCTURE?

To the Editor of THE LANCET.

SIR,—Dr. Paterson and Dr. Bray tell us (THE LANCET, Nov. 24th, p. 1071) that 3000 tonsillectomies were performed at Great Ormond-street Hospital last year, and they suggest that no other operation available in this problem shows such dramatic result.

[illegible] alternative to the complete removal of the tonsil, an operation performed nowadays in [illegible] in which there is enlargement, [illegible] any condition of the [illegible] in which the [illegible] of causing the [illegible] the tonsils are [illegible] in multitudes [illegible] they are called upon to treat. A medical correspo[illegible] recently gave an account of the almost app[illegible] fact that, by means of what was called "team-w[illegible] the throat surgeons were able to deal with 20 ca[illegible] an hour. The children, as far as I am able to l[illegible] are mostly sent home the next day. How is it po[illegible] to ensure freedom from septic infection when a [illegible] oozing surface, some 4 sq. in. in extent, is left afte[illegible] tonsils have been removed, and the adenoid t[illegible] scraped away? There is also the risk of hæmorr[illegible]

All is not well when throat surgeons regard[illegible] dangers lightly and laugh at those who, after [illegible] years of clinical experience, consider tonsillec[illegible] unwise. We, who object, consider that all [illegible] lymphatic tissue of the body is nature's first li[illegible] defence against systemic infection. Why is ex[illegible] of lymphatic gland recommended for adenoids [illegible] hypertrophied tonsils? Can anyone quote a ca[illegible] which phthisis or general tuberculosis was defin[illegible] proved to originate from a local nidus in the ton[illegible] elsewhere? I can give instances which point ir[illegible] opposite direction. When I was in general pra[illegible] many years ago a man of 50 had a small sinus lea[illegible] to a tuberculous great toe-joint which had [illegible] diseased for many years. It gave him very [illegible] inconvenience in his daily work. A few drops of [illegible] came away every morning when he washed it, an[illegible] covered it with a small piece of lint. A young F.R[illegible] who was acting as locum tenens for me advised [illegible] to have the joint excised, and a month later the [illegible] fellow was dying of acute miliary tuberculosis [illegible] have never forgotten that lesson, "Let sleeping [illegible] lie." Daily auto-immunisation from the toe-joint [illegible] been sufficient to keep the body healthy for 26 y[illegible] and, but for the surgical interference, the man w[illegible] not, in my opinion, have lost his life from that ca[illegible] I believe that lymphatic tissue has an impor[illegible] function, similar to that of the lymphocytes of [illegible] blood. The tonsil is a mass of lymphoid nests, rend[illegible] sponge-like by a number of lacunæ, crypts, or folli[illegible] call them what you will, which penetrate deeply [illegible] the interstices between the lymphoid tissue. T[illegible] channels are open on the surface and end in cul[illegible] sacs in the substance of the tonsil. The tons[illegible] separated from the other structures of the phar[illegible] by a fibrous capsule, the function of which seem[illegible] be to prevent the passage of infective material [illegible] the tissue behind it. As, however, the tonsil is fr[illegible] supplied with blood-vessels, the serum-soluble tox[illegible] produced in the lymphoid nests which absorb pa[illegible] genic germs from the crypts, find their way into [illegible] blood stream and stimulate the formation of a[illegible] bodies which immunise the general system. I sub[illegible] that the rise of temperature which occurs in t[illegible] infections which in the old days were called "di[illegible] theritic throats" (streptococcal infection) is du[illegible] the absorption and circulation in the blood of [illegible] toxin generated in the lymph tissue. These thr[illegible] yield readily to conservative treatment: spray[illegible] with an efficient antiseptic solution and the adm[illegible] stration of that powerful anti-streptococcic d[illegible] acetanilide.

What is the alternative treatment? Surely [illegible] galvano-cautery. For 35 years I have used no o[illegible] method. After a local anæsthetic the cautery poin[illegible] inserted deeply into any caseating follicle which [illegible] be seen, and quickly moved round and round in [illegible] circle, so that it disinfects the surrounding lining [illegible] the lacuna. It also opens wide the mouth of the cry[illegible] which never closes again, thus ensuring free draina[illegible] I estimate that in quite 75 p.c. of septic throa[illegible] pre-existing septic infection is the cause; in such cas[illegible] I deal with the nasal mucosa first, using a spray [illegible] 1-20 oz. in camphor water, flavoured wi[illegible] peppermint and lavender-oil. Any septic or hype[illegible] tophied particles are treated first with the galvan[illegible] cautery. The vascular appearance of the interior [illegible] the pharynx subside, the muco[illegible] [illegible] and excessive septic [illegible]

[illegible] specialists may answer: How can we fin[illegible] [illegible] to deal with all the children we are calle[illegible]

upon to treat? Moreover, it is not possible to get young children to sit up in a chair and submit to such a procedure. The first point calls for the establishment of many more special throat hospitals. To the second point I reply, if all authorities are unanimous in regarding the tonsil as a protective organ in childhood, why remove it? Treatment of enlarged tonsils should be deferred until the child has reached such an age as to permit the cautery to be used. In the meantime endocrine medication is valuable. The effect of small doses of thyroid, given over a period of months, is astonishing in children showing marked ill-development and malnutrition.

I repudiate any suggestion that I am trying to teach throat specialists their business, but I submit that an experienced general physician is better informed as to the causes, effects, and treatment of chronic sepsis and hypertrophy of the tonsils. I plead for the more frequent use of the cautery in tonsillar disease. It leaves no raw surface; it causes no bleeding; it leaves a portion of the tonsil behind to continue its function, and it does not damage the capsule which guards the peritonsillar area from that dangerous septic infection which may occur after tonsillectomy.—I am, Sir, yours faithfully,

Harley-street, W., Dec. 1st. W. S. WHITCOMBE.

CHRONIC SPASMODIC AFFECTIONS OF THE COLON.

To the Editor of THE LANCET.

SIR,—The admirable and important lecture by Dr. Ryle that appeared in your columns last week deals with a difficult subject of great interest in a lucid and compendious fashion that places us all under obligation to him. But I cannot help feeling that the ultimate issue of Dr. Ryle's observations, anticipated in almost every paragraph of the address, is given in the sentence that declares psychotherapy to play an important part in the treatment of spasticity of the colon and mucous colitis. I would go a little farther, and say that psychotherapy plays an indispensable part, provided that it is undertaken by the general physician or practitioner who controls the physical therapy as well.

As a matter of fact, like, I suppose, many others, I have been accustomed for some years past, both in practice and in teaching, to state the view—well-founded, I believe—that spasticity of the colon and mucous colitis should be looked upon as visceral expressions of emotional or affective states, that seize upon an "organ-inferiority" as giving the line of least resistance to what is sometimes called a "get-out." The emotional state of which the tension is thus somewhat eased may not always be a quite normal emotional state, nor occurring under quite normal circumstances in a quite normal person. As much may be said about the emotional states that lead to weeping—a pretty familiar "visceral" expression of an affective state. However, the phraseology of the Old Testament should convince us that, in former times, the expression of emotion by bowel states was familiar. It certainly was during the war. But the state of emotional or affective tension that is responsible for spasticity of the colon, or mucous colitis, is not always the superficial and obvious "worry" or the like, of which the patient is sometimes, if not always, the subject. It is sometimes deeper, something repressed, and at first not known, consciously, or not recognised by the patient. It arises always, I think, from a difficulty in relation to sexual life or adjustment.

How this may be we can perhaps imagine if we look at any modern diagram of the vegetative nervous systems, when we see that the colon, but *not* the small intestine, is functionally associated, or represented, in the "sacral autonomic" with the pelvic organs, in either sex. This fact explains, inter alia, why gynæcologists so commonly find some "pelvic trouble" in the mucous colitis cases. But the "trouble" is not the whole cause of the affection; it is the organ-inferiority which may sometimes provoke the emotional state, in some degree, sometimes, and, otherwise, may be a secondary event, consequent upon the emotional difficulty or conflict. To remove the uterus or appendages, or to resect the colon, in these cases—as often has been done—is as foolish as to take off the telephone receiver to avoid getting rung up on a "wrong number" call.

In alluding to the almost invariable origin of the emotional stress in some sexual relation, I do not, of course, mean to suggest that the cure for spasticity of the colon or of mucous colitis is to be found in sexual indulgence. But I do suggest that, if the patient's inner conflict is made clear to him, and an adjustment is achieved, by sublimation or otherwise, then, if such wise therapeutic measures as those recommended by Dr. Ryle are instituted, the patient gets well. If his whole life-scheme, and not merely the problem of the moment, be adjusted, he or she *keeps well*.

Finally, I would agree absolutely with Dr. Ryle in saying that there is a relation or connexion between spastic colon and migraine. The same kind of people, acting in the same kind of way under stress or in conflict, suffer from these affections. But, if in spastic colon and mucous colitis we have to do with an affection whose physical mechanism is that of the sacral autonomic, in migraine, surely, we are concerned with the oculomotor and, sometimes, the vagal parts of the cranial autonomic system or systems. Here the common organ-inferiority is in respect of the eye, and the trouble is far less exclusively sexual than in the case of the colon and its neuroses. But, in both cases, in both sets of cases, the "thorough understanding" for which Dr. Ryle asks, by way of diagnosis, can only come when the patient's condition is individualised. It escapes us when it is "typed."—I am, Sir, yours faithfully,

Wimpole-street, W., Nov. 30th. F. G. CROOKSHANK.

SMOKELESS FUEL AND PUBLIC HEALTH.

To the Editor of THE LANCET.

SIR,—We, the undersigned medical officers of health, desire to draw attention to the fact that the Public Health (Smoke Abatement) Act, 1926, now being applied in various areas, is by itself inadequate to deal with the serious consequences to public health of atmospheric pollution—due mainly to the burning of raw coal—inasmuch as it deals solely with the emission of industrial smoke.

Atmospheric impurities are undoubtedly directly responsible in a wide measure for pulmonary diseases, and indirectly, by reducing sunshine, for diseases peculiar to childhood (notably rickets), as well as for a general lowering of national vitality. This deplorable state of affairs cannot be remedied until practical steps on a large scale are taken to deal with the all-important problem of domestic smoke.

We desire to endorse the opinion expressed by Sir George Newman, chief medical officer of the Ministry of Health, in his annual report for 1925, that

"Every form of industrial or mechanical contrivance which either prevents or reduces pollution of the atmosphere is a contribution to the public health, and this aspect of the problem calls for the continued and vigilant attention both of authorities and those responsible for commercial concerns."

For the foregoing reason we are of opinion that the Government and local authorities should not only encourage the wider adoption of existing smokeless fuels in common use, such as gas and electricity, but should also, by educational methods or the creation of local supplies, endeavour to secure the general use of solid smokeless fuels, such as those derived from low temperature carbonisation.

We cannot associate ourselves with the view that commercial production of smokeless fuels by low temperature carbonisation has not yet been reached, inasmuch as various types of such fuels are now actually available to the public; on the contrary, we wish to record our conviction that a substantial reduction of domestic smoke and consequent improve-

ment of national health and physique would result if the appropriate Government departments and local authorities officially recognised and encouraged the wider production and use of the smokeless fuels that are now being marketed by British enterprise.

We are, Sir, yours faithfully,

(Signed)

CHARLES PORTER, M.O.H. St. Marylebone.
J. JOHNSTONE JERVIS, M.O.H. Leeds; Secretary, West Riding of Yorkshire Regional Smoke Abatement Committee.
JAMES FENTON, M.O.H. Kensington.
P. R. MCNAUGHT, M.O.H. York.
C. W. HUTT, M.O.H. Holborn.
S. G. MOORE, M.O.H. Huddersfield; Lecturer in Public Hygiene, Technical College, Huddersfield.
D. J. THOMAS, M.O.H. Acton.
WILLIAM BARR, M.O.H. Rotherham.
FRED E. WYNNE, M.O.H. Sheffield; Professor of Public Health, Sheffield University.
T. E. FRANCIS, M.O.H. Barnsley.
C. KILLICK MILLARD, M.O.H. Leicester.
G. GRANVILLE BUCKLEY, M.O.H. Bury.

Dec. 4th, 1928.

ULTRA-VIOLET LIGHT AND CANCER.

To the Editor of THE LANCET.

SIR,—Dr. Findlay's paper in your issue of Nov. 24th is of such vast importance, both to the public and to actinotherapists, that one is compelled to ask the author for his views on the following points which arise from his work.

1. In his review of the literature, the terms "weather," "solar rays," and "sunlight" are used synonymously, but the author incriminates the ultra-violet portion of these rays only.

2. To prove the effect of sunlight experimentally, a mercury-vapour lamp was used. The spectrum of the mercury-vapour lamp bears little resemblance to that of sunlight. It is quite impossible to say whether the rays of the lamp below 2950 A.U., which do not occur in sunlight, or those above 2950 A.U. were responsible for the tumour formation.

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4. Did the animals establish any tolerance to the dose? The average human skin would rapidly have established its own protection by the formation of pigment. Although, with the dose administered to the mice, the human skin would have shown a marked erythema at first, subsequent doses repeated four times a week would have had no effect. In the albino mice, on the contrary, every dose probably served as a new irritant.

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vincing if the term infra-red were substituted for ultra-violet.

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The points raised in no way detract from the value of Dr. Findlay's demonstration that the mercury-vapour spectrum under certain conditions may produce cancer. The observation is of the utmost significance and will do a great deal towards rescuing ultra-violet therapy from its present unsatisfactory position.

I am, Sir, yours faithfully,

London, W., Dec. 1st, 1928. M. WEINBREN.

Dr. Percy Hall writes to say that he has entirely severed his connexion with National Sun Ray and Health Centres, Ltd.

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A MEETING of the General Committee was held at 8, Queen-square, London, W.C., on Nov. 28th, the Duke of Bedford presiding. Sir Humphry Rolleston, as chairman of the Executive Committee, moved the adoption of the twenty-sixth annual report of the Fund for the year 1927–28, and summarised the report of the director, on which we have already commented (THE LANCET, Dec. 1st, 1928, p. 1137). He spoke also of the wide range of the activities of the Fund during the 25 years of its existence. A store of knowledge had been gained which made it possible to judge the validity of statements published by individual workers. During the past year a surgeon of repute presented at a surgical congress in Germany the results of a prolonged and extensive investigation in which he claimed to have proved the transmission of human cancer to mice in such a way that the infective nature of cancer was thereby established. If such a conclusion were justified it would mean a complete revolution in our conception of the nature of the disease and also in its treatment; but it would also create great alarm among the general public, and especially among those who have relatives suffering from cancer. Fortunately, the data collected in the laboratories of the Fund concerning the frequency with which cancer naturally affects mice throughout the whole course of their lives, made it possible to state definitely that in these experiments the human cancer was not transmitted to mice. Sir Humphry Rolleston referred to the zeal and patience of Dr. J. A. Murray, the director, and his staff, and con[illegible]lated the committee on having been able to enlist and the services of men who were willing and able to elaborate and difficult experiments from year [illegible]. The resolution was seconded by Sir D'Arcy [illegible] carried unanimously. The President, in [illegible]tion thanking the officers, drew attention [illegible] taken by the profession and the public [illegible] of cancer, which overshadowed [illegible] International Conference and [illegible] of the detailed statistical [illegible] issued during the last [illegible] of the Ministry of [illegible] practical problems [illegible]sity give but [illegible] problems of [illegible] was

upon to treat? Moreover, it is not possible to get young children to sit up in a chair and submit to such a procedure. The first point calls for the establishment of many more special throat hospitals. To the second point I reply, if all authorities are unanimous in regarding the tonsil as a protective organ in childhood, why remove it? Treatment of enlarged tonsils should be deferred until the child has reached such an age as to permit the cautery to be used. In the meantime endocrine medication is valuable. The effect of small doses of thyroid, given over a period of months, is astonishing in children showing marked ill-development and malnutrition.

I repudiate any suggestion that I am trying to teach throat specialists their business, but I submit that an experienced general physician is better informed as to the causes, effects, and treatment of chronic sepsis and hypertrophy of the tonsils. I plead for the more frequent use of the cautery in tonsillar disease. It leaves no raw surface; it causes no bleeding; it leaves a portion of the tonsil behind to continue its function, and it does not damage the capsule which guards the peritonsillar area from that dangerous septic infection which may occur after tonsillectomy.—I am, Sir, yours faithfully,

Harley-street, W., Dec. 1st. W. S. WHITCOMBE.

CHRONIC SPASMODIC AFFECTIONS OF THE COLON.

To the Editor of THE LANCET.

SIR,—The admirable and important lecture by Dr. Ryle that appeared in your columns last week deals with a difficult subject of great interest in a lucid and compendious fashion that places us all under obligation to him. But I cannot help feeling that the ultimate issue of Dr. Ryle's observations, anticipated in almost every paragraph of the address, is given in the sentence that declares psychotherapy to play an important part in the treatment of spasticity of the colon and mucous colitis. I would go a little farther, and say that psychotherapy plays an indispensable part, provided that it is undertaken by the general physician or practitioner who controls the physical therapy as well.

As a matter of fact, like, I suppose, many others, I have been accustomed for some years past, both in practice and in teaching, to state the view—well-founded, I believe—that spasticity of the colon and mucous colitis should be looked upon as visceral expressions of emotional or affective states, that seize upon an "organ-inferiority" as giving the line of least resistance to what is sometimes called a "get-out." The emotional state of which the tension is thus somewhat eased may not always be a quite normal emotional state, nor occurring under quite normal circumstances in a quite normal person. As much may be said about the emotional states that lead to weeping—a pretty familiar "visceral" expression of an affective state. However, the phraseology of the Old Testament should convince us that, in former times, the expression of emotion by bowel states was familiar. It certainly was during the war. But the state of emotional or affective tension that is responsible for spasticity of the colon, or mucous colitis, is not always the superficial and obvious "worry" or the like, of which the patient is sometimes, if not always, the subject. It is sometimes deeper, something repressed, and at first not known, consciously, or not recognised by the patient. It arises always, I think, from a difficulty in relation to sexual life or adjustment.

How this may be we can perhaps imagine if we look at any modern diagram of the vegetative nervous systems, when we see that the colon, but *not* the small intestine, is functionally associated, or represented, in the "sacral autonomic" with the pelvic organs, in either sex. This fact explains, inter alia, why gynæcologists so commonly find some "pelvic trouble" in the mucous colitis cases. But the "trouble" is not the whole cause of the affection; it is the organ-inferiority which may sometimes provoke the emotional state, in some degree, sometimes, and, otherwise, may be a secondary event, consequent upon the emotional difficulty or conflict. To remove the uterus or appendages, or to resect the colon, in these cases—as often has been done—is as foolish as to take off the telephone receiver to avoid getting rung up on a "wrong number" call.

In alluding to the almost invariable origin of the emotional stress in some sexual relation, I do not, of course, mean to suggest that the cure for spasticity of the colon or of mucous colitis is to be found in sexual indulgence. But I do suggest that, if the patient's inner conflict is made clear to him, and an adjustment is achieved, by sublimation or otherwise, then, if such wise therapeutic measures as those recommended by Dr. Ryle are instituted, the patient gets well. If his whole life-scheme, and not merely the problem of the moment, be adjusted, he or she *keeps well*.

Finally, I would agree absolutely with Dr. Ryle in saying that there is a relation or connexion between spastic colon and migraine. The same kind of people, acting in the same kind of way under stress or in conflict, suffer from these affections. But, if in spastic colon and mucous colitis we have to do with an affection whose physical mechanism is that of the sacral autonomic, in migraine, surely, we are concerned with the oculomotor and, sometimes, the vagal parts of the cranial autonomic system or systems. Here the common organ-inferiority is in respect of the eye, and the trouble is far less exclusively sexual than in the case of the colon and its neuroses. But, in both cases, in both sets of cases, the "thorough understanding" for which Dr. Ryle asks, by way of diagnosis, can only come when the patient's condition is individualised. It escapes us when it is "typed."—I am, Sir, yours faithfully,

Wimpole-street, W., Nov. 30th. F. G. CROOKSHANK.

SMOKELESS FUEL AND PUBLIC HEALTH.

To the Editor of THE LANCET.

SIR,—We, the undersigned medical officers of health, desire to draw attention to the fact that the Public Health (Smoke Abatement) Act, 1926, now being applied in various areas, is by itself inadequate to deal with the serious consequences to public health of atmospheric pollution—due mainly to the burning of raw coal—inasmuch as it deals solely with the emission of industrial smoke.

Atmospheric impurities are undoubtedly directly responsible in a wide measure for pulmonary diseases, and indirectly, by reducing sunshine, for diseases peculiar to childhood (notably rickets), as well as for a general lowering of national vitality. This deplorable state of affairs cannot be remedied until practical steps on a large scale are taken to deal with the all-important problem of domestic smoke.

We desire to endorse the opinion expressed by Sir George Newman, chief medical officer of the Ministry of Health, in his annual report for 1925, that

"Every form of industrial or mechanical contrivance which either prevents or reduces pollution of the atmosphere is a contribution to the public health, and this aspect of the problem calls for the continued and vigilant attention both of authorities and those responsible for commercial concerns."

For the foregoing reason we are of opinion that the Government and local authorities should not only encourage the wider adoption of existing smokeless fuels in common use, such as gas and electricity, but should also, by educational methods or the creation of local supplies, endeavour to secure the general use of solid smokeless fuels, such as those derived from low temperature carbonisation.

We cannot associate ourselves with the view that commercial production of smokeless fuels by low temperature carbonisation has not yet been reached, inasmuch as various types of such fuels are now actually available to the public; on the contrary, we wish to record our conviction that a substantial reduction of domestic smoke and consequent improve-

ment of national health and physique would result if the appropriate Government departments and local authorities officially recognised and encouraged the wider production and use of the smokeless fuels that are now being marketed by British enterprise.

We are, Sir, yours faithfully,

(Signed)

CHARLES PORTER, M.O.H. St. Marylebone.
J. JOHNSTONE JERVIS, M.O.H. Leeds; Secretary, West Riding of Yorkshire Regional Smoke Abatement Committee.
JAMES FENTON, M.O.H. Kensington.
P. R. MCNAUGHT, M.O.H. York.
C. W. HUTT, M.O.H. Holborn.
S. G. MOORE, M.O.H. Huddersfield; Lecturer in Public Hygiene, Technical College, Huddersfield.
D. J. THOMAS, M.O.H. Acton.
WILLIAM BARR, M.O.H. Rotherham.
FRED E. WYNNE, M.O.H. Sheffield; Professor of Public Health, Sheffield University.
T. E. FRANCIS, M.O.H. Barnsley.
C. KILLICK MILLARD, M.O.H. Leicester.
G. GRANVILLE BUCKLEY, M.O.H. Bury.

Dec. 4th, 1928.

ULTRA-VIOLET LIGHT AND CANCER.

To the Editor of THE LANCET.

SIR,—Dr. Findlay's paper in your issue of Nov. 24th is of such vast importance, both to the public and to actinotherapists, that one is compelled to ask the author for his views on the following points which arise from his work.

1. In his review of the literature, the terms "weather," "solar rays," and "sunlight" are used synonymously, but the author incriminates the ultra-violet portion of these rays only.

2. To prove the effect of sunlight experimentally, a mercury-vapour lamp was used. The spectrum of the mercury-vapour lamp bears little resemblance to that of sunlight. It is quite impossible to say whether the rays of the lamp below 2950 A.U., which do not occur in sunlight, or those above 2950 A.U. were responsible for the tumour formation.

3. The dose is expressed in terms of time and distance and not in terms of erythema. Assuming that the burner was a new one, two minutes at 18 in. would have caused a marked erythema on the average human skin. This dose was administered four times a week. What degree of erythema did this produce on the mice? Ulceration was mentioned in Experiment 3, where the dose was even heavier than the above. Was there any relation between the ulceration and subsequent formation of growth?

4. Did the animals establish any tolerance to the dose? The average human skin would rapidly have established its own protection by the formation of pigment. Although, with the dose administered to the mice, the human skin would have shown a marked erythema at first, subsequent doses repeated four times a week would have had no effect. In the albino mice, on the contrary, every dose probably served as a new irritant.

5. Could experiments be carried out interposing a Uviol filter to cut out the rays below 3000 A. and increasing the time of exposure so that the dose would correspond to a first degree erythema on human skin?

6. Could similar experiments be carried out using 1000–1500-watt radiant heat bulb (glass) so that the effect of the visible rays and infra-red could be estimated?

7. The authorities quoted certainly appear to make a good case in favour of the hypothesis that ultra-violet rays play an important part in the development of cancer on exposed skin. In those of his references which I have been able to consult there is, however, no mention of the skin cancer presumably due to irritation by heat, such as cancer in the kangri-carrying natives of Kashmir or the cancer on the shins of engine-drivers.

8. With the latter types in mind, the papers of some of his authorities would have been equally convincing if the term infra-red were substituted for ultra-violet.

9. Until it has been demonstrated that infra-red rays cannot produce cancer under similar condition, it is doubtful whether he is justified in assuming that his experiments support the ultra-violet hypothesis.

The points raised in no way detract from the value of Dr. Findlay's demonstration that the mercury-vapour spectrum under certain conditions may produce cancer. The observation is of the utmost significance and will do a great deal towards rescuing ultra-violet therapy from its present unsatisfactory position.

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Sir Basil Mayhew was elected a Vice-President of the Fund. Prof. A. E. Boycott and Prof. William Bulloch were re-elected members, and Sir Thomas Barlow and Sir Anthony Bowlby additional members, of the Executive Committee.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

LOCAL GOVERNMENT BILL.

IN the House of Commons on Monday, Tuesday, and Wednesday, Nov. 26th, 27th, and 28th, the debate was resumed on the Local Government Bill.

Following the speech by Mr. NEVILLE CHAMBERLAIN, Minister of Health, in moving the second reading, which was reported in our last issue:

Official Labour Amendment.

Mr. ARTHUR GREENWOOD moved the following amendment on behalf of the Labour Party:—

This House declines to assent to the Second Reading of a Bill which, whilst amending the law relating to poor relief, perpetuates the evils of the poor-law system and extends the vicious practice of unrepresentative persons being nominated to membership of elected bodies, makes no provision for the prevention of destitution, fails to make unemployment a national responsibility, and will not appreciably relieve the financial position of necessitous areas; will arrest the normal and steady development of local health services by the establishment of fixed block grants from the Exchequer and the imposition of a charge for treatment in hospitals, especially maternity hospitals, a proposal calculated to increase the already high mortality amongst mothers; inaugurates a system of rating relief that will be unfair in its incidence; and, by failing adequately to reimburse local authorities for loss of revenue, will add to the burdens of shopkeepers, householders, and other ratepayers.

He said that he was a strong opponent of the Bill. The block grant was really a device for saving the money of the taxpayer; if it did not do that it failed in its purpose. If block grants meant the bringing together of cognate and allied services there might be something to be said for them. But where they consisted in bringing together services which had absolutely no relation to one another the results were bound to be absurd. He believed that if they stabilised the grant for five years they could not help impeding the development of the health services. It meant that the additional expenditure would have to be borne entirely out of the rates, or that additional expenditure would be put aside and the service would not be developed. Since 1909, when the Royal Commission on the Poor-law reported, the Labour Party had been pledged to the abolition of the board of guardians and the poor-law system as they knew it. Under this Bill the poor-law system remained as firmly established as ever. It was still a deterrent system which discouraged people in their trouble from going to the poor-law authorities. A proportion of non-elected persons who knew the ropes of the game were the persons who were going to run the guardians' committee, and not the directly elected representatives from the county or county district areas. He looked with great apprehension on the new proposal about compulsory powers to be exercised by local authorities to demand payment in respect of certain health services. The Minister admitted that in the case of infectious diseases it was very necessary that persons suffering from them should be taken into hospitals. It was equally necessary for the good of the community that the expectant mother should receive treatment, and that women with cancer should have radiological treatment, without necessarily having to make payment. This must injure the health services of the country. The energies of the local authorities would be absorbed in making inquiries and collecting money instead of being devoted to rooting out diseases and discovering their causes. The Bill was going to make serious inroads into the independence of the local governing bodies. By concentration of power in the hands of counties and county boroughs the Government were delivering a smashing blow at all the non-county boroughs, the large urban districts which were efficiently administered to-day, and whose powers might admirably have been extended.

Mr. DUNNICO, in seconding the amendment, said that the effect of the block grant would be to destroy initiative and to prevent advanced local authorities from undertaking work which in normal conditions they would be glad to do. The maternity and child welfare movement should be greatly developed in the future, but the block grant would kill and stop its development. The Government, under the Bill, were making it compulsory on local authorities to sue in the county court mothers who had gone into maternity homes, yet in the same clause they excused those who sought treatment for infectious diseases and venereal disease.

Mr. R. HUDSON said if there was one thing that the Bill was calculated to do it was to decrease maternal mortality by making available to women all over the country accommodation in institutions under the control and care of the county councils—accommodation which had hitherto been reserved exclusively for the destitute poor, and, therefore, but meagrely taken advantage of. When institutions were dealt with as proposed in the Bill, it would be possible for the county council for the first time seriously to tackle the disquieting increase in the rate of maternal mortality.

Mr. ERNEST BROWN, who spoke for the Liberal Party, said that one of his reasons for objecting to the Bill was that he could not see how they could combine the idealistic conception of a great extension of medical services under one control with the reactionary and retrogressive financial scheme of block grants, or how they could provide for its expansion. It was incontrovertible that had the block grant system prevailed during the past 25 years instead of the "fifty-fifty" system there would have been a far smaller extension in those services than there had been. As regarded the poor-law, the scheme in his judgment did not propose to carry out an efficient distribution of poor-law duties, the appointed bodies proposed would not function so well as the elected bodies which they superseded, and the wealth of talent for administration among women would find no adequate outlet as it had done through the boards of guardians. The gravest of all difficulties in Part I. of the Bill was that it shirked the issue of the able-bodied poor.

Mr. SCURR complained of the clause which made it compulsory for county and county borough councils to levy charges on persons who would receive assistance in the shape of medical treatment. He was concerned with the prevention and cure of disease, and he held that it should not be a question of whether a patient was in a position to pay or not but whether he or she needed treatment.

Sir HENRY SLESSER said this measure in no wise humanised or altered the existing poor-law. Since the Poor Law Act of 1834 one authority after another had been appointed by the State for the purpose of relieving the various distressed persons—the education authority, the health authority, the lunacy authority, the mental defective authority, and many others—for dealing with the very matters which used to be within the province of the old poor-law. Therefore, the continuation of the old poor-law was on all sides, he thought, admitted to be unjustifiable, wasteful, cruel, and useless. Yet as regards the poor-law this Bill did nothing of value, and what it did was reactionary and detrimental.

Medical Views.

Lieut.-Colonel FREMANTLE called attention to what he regarded as the most authoritative announcement that had yet been made by the medical profession. It was the considered statement of the British Medical Association Poor-law Relief Committee, whose conclusion was on the matter—

Resolved, that the Council be recommended to express its approval of the Local Government Bill, 1928, in so far as it attempts to secure unification of the medical services of the country.

The Bill was discussed under three main categories: first, machinery of local administration; second, the effect of the Bill on medical officers of health and poor-law medical officers; and, third, the effect of the finances of the Bill on the health services. He had not put the report before the House in full detail. After endorsing the measure under these several heads in which they were particularly concerned, they proceeded to suggest certain alleviations, modifications, and amendments which could be produced in Committee, and which would be produced in due course. He hoped that members in all parts of the House would combine with him in helping to get amendments accepted in order further to improve the machinery of the Bill. In addition to calling attention to the opinion of the British Medical Association, representing general medical practitioners for the most part, and also working in coöperation with those who were special medical officers of health, he wished to state this, being himself a medical officer of health for a county area in which those matters were constantly to the fore, and who for a period of 12 or 14 years had had to consider and work and report upon the complications which this measure hoped to simplify. In the course of those many years, the county medical officer of health had always, from first to last, felt the hopeless confusion of authority which existed between the different authorities dealing with health, and that, in every way, the work of public health had been crippled because of this very complexity. They had absolute separation between the sanitary authorities and the poor-law authorities. The poor-law authorities dealt with a very large number of questions vital to health, and over these the sanitary authorities of the county council had had no concern and no control. They might have questions of families suffering from tuberculosis which largely came under the poor-law, and it was only when they had gone too far that they came under the sanitary authorities. There was no relation between the poor-law authorities, whether in their relief services or their institutional services, and the sanitary authorities. There was no real combination between the sanitary authorities, on the one hand, and the county authority on the other. The only powers that the county authority had over the sanitary authority was occasionally to report to the Local Government

Board, as it then was, or to the Ministry of Health, as it now was, cases in which the sanitary authority was in default, and it appeared that the Ministry might take certain action. In addition to that, there were, of course, the insurance authorities and other bodies dealing separately with health questions. One of the most crying needs was for some kind of coördination among the different health authorities. The Bill met that in a way that exceeded any proposals that had been made hitherto, and the part that had been alleged against it, that it was a combination of different measures was, from this point of view, clearly in its favour. It was taking the opportunity to bring together an enormous number of these different services, which were required at the same time, in order to get a big move, a big change, and a big reform—indeed, more than a reform, for it was an absolute revolution of local government. Let them consider the position they were in in the counties in regard to fever hospitals. They had fever hospitals started by one of the sanitary authorities, and other hospitals by larger authorities, or combinations of authorities. They had some small authorities left outside existing organisations of sanitary authorities who never knew where to find accommodation for their infectious patients because they were not big enough to start fever hospitals. They had also the small-pox system, with a separate set of hospitals, or with no hospital in the county generally large enough to undertake the provision of proper small-pox accommodation. They had the county council, with no real power to coördinate these cases. This Bill gave the powers, which were laid down, to the council authorities to make definite relations with the sanitary authorities which were running the hospitals, and at the same time to use the institutions of the poor-law for combined purposes. Here they had the possibility of coördinating the whole of the fever hospital services of the county. It was a possibility of enormous advantage in regard to the cause of infection, and one which might lead to economy. At the same time, they might get much more efficient services and more efficient institutions for the patient.

Another point which required coördination, and which had not been mentioned that evening—it was not mentioned by the Minister of Health in his opening speech—was the question of mental hospitals and mental deficiency institutions and the coördination that was required in that respect. A very large amount of work in regard to dementia was the concern of the poor-law and the poor-law institutions, and a large amount of work in regard to the question of mental asylums, mental hospitals, and mental deficiency came under the heading of the county councils. Therefore, they had separate bodies dealing with all these subjects. Under this Bill, they had the possibility of coördinating the work, and by abolishing the poor-law authority the county councils would be able to deal with the mental ailments, dementia, and mental deficiency, as one undivided authority for the whole county area. As a medical officer he could not give unstinted adherence to the Bill without suggesting the necessity for looking into the possibilities and the necessity for amendments.

Maternity and Child Welfare Services.

Suggestions had been made against the Bill from the point of view of those who were concerned with maternity and child welfare services. It was quite true that those were developing services, and were a great essential need of the country. They were services administered very largely by voluntary effort, by women and others who were not ordinarily concerned in battering their way through rules and regulations, and it was certain that a great number of those who were connected with these services were seriously concerned as to the possibilities of danger from the operation of the block grant. They had to look into that. The Minister of Health had said that the last thing he intended to do was to hinder these maternity and child welfare services in any way. He had put into three clauses definite provisions for easing the situation in regard to these services. He (Dr. Fremantle) still hoped that further security would be given than appeared to be given at present. He was not at all sure, although he believed in the block grant system in the long run for the sake of the eventual good to local government, that the time was ripe to apply it at once to the maternity and child welfare services, and it might be advisable and possible to give a little longer time, say, for the first quinquennium, to allow matters to go on under the present system while the voluntary associations were making the adjustments that were necessary to enable them to work the system proposed by the block grants. He hoped that the House would look at the matter in the truest and broadest sense. In the different points of the Bill which affected the public health, with which he had not time to deal, they had to consider not merely the services as they were at the present time, but they had to consider the building up of a stronger, more independent, and more powerful local government system than had existed hitherto. Local government had been weakened because there had been this enormous diversity and independence of bodies doing this work. In regard to the much debated subject of the local supervising authority under the Midwives Act, a further reservation had to be made in regard to coördination. It was a difficult subject, and obviously it would be better theoretically if the Midwives Acts could be administered by the same authority which administered the maternity and child welfare centres and other Acts. But the difficulty was that midwives and those associated with them felt strongly and knew that the ouly authority capable of securing the proper experience and the proper inspection of midwives was the county authority. There were minor exceptions, and it was hoped that in regard, at any rate, to that aspect of the midwives' service, the responsibility which was given by this Bill to the Minister of Health to approve or not approve the transfer might be most carefully used. With regard to the proposals to secure unification of the medical services of the country, there were two reservations which should be mentioned, reservations which were capable of adjustment, he hoped, in Committee. The first was with regard to the distribution of poor-law functions. Under Clause 4 it was provided that the poor-law functions might be distributed in regard to health services among the committees of the county councils or county borough councils which dealt already with the Education and Public Health Acts, the Maternity and Child Welfare Act, and so forth. But it used the word "may." That gave them the option of transferring these functions to the new guardians' subcommittees. That would make confusion worse confounded, or rather it would perpetuate the present position, which would be right against the Report of the Poor-law Commission, which this Bill practically proposed to carry out. Members on all sides of the House who had been keen on public health development were even keener on the proper distribution of functions, and the British Medical Association and the medical officers of health were combined in saying that they wanted each committee of the county councils and county borough councils to be responsible for the whole sphere of service, and quite independent of the separate individuals or class of individuals with which they were dealing.

Voluntary Hospital Coöperation.

The question of the hospitals was a most difficult and thorny one. There was naturally a great sensitiveness among all those who were keen upon the voluntary hospitals and all that they meant regarding the competition which might be set up between the voluntary hospitals and the municipal hospitals. The best arrangement for overcoming this difficulty was by means of mutual understanding and coöperation, and it was strongly suggested by the British Medical Association—and he backed the suggestion—that the county and county borough councils should be required to set up hospitals' subcommittees who would be able to advise them regarding the efficient management of the hospitals and effect coöperation with the voluntary hospitals. Some regret might be expressed that the Lunacy Acts were left out of Clause 4. The reason for the omission was that it was intended to deal with the Lunacy Acts in pursuance of the report of the Royal Commission. They had pressed for that for a long time, and he hoped that it would be carried out in the next Parliament. He noted with satisfaction the coördination of the medical officer of health services as a step in the direction of the further increase of whole-time medical officers of health, whether by the coördination of districts or by uniting the services of the county medical officer with those of districts. He was, however, at loggerheads with the Minister of Health in regard to the rural areas. He maintained that they could not say that one system was ideal rather than another, and the suggestion that the only way to deal with rural areas was by whole-time medical officers, who did not engage in private practice, was, in his opinion, wrong. What was wanted in rural areas were men of the best character with the best opportunity to carry out the work. There were obvious exceptions, but there must be some latitude allowed. Those concerned with public health strongly approved the transfer of births and deaths registration to the county authority. With regard to town-planning there was one reservation which he would like to make. He was not at all clear that the financial provisions of the Bill made proper provision for the assistance of those experiments which were largely helped by the Government, such as Welwyn or Letchworth garden cities. Where there were rapidly developing services, there was likely, he thought, to be hardship under the Bill, and he hoped that the matter would be further considered. Lastly, he hoped that some further progress might be made in separating the health services from the system of relief. That had been the cardinal policy of the medical profession all along. It was a very difficult question, and he still thought that those who could afford to pay ought to do so, and, anyhow, the public services ought not to be abused. But, on the other hand, they had the precedent of the Infectious Diseases Acts, and he hoped that by degrees, as these municipal health services developed under this new arrange-

ment, the strictly health services might be considered as extra services and separate from relief.

Miss SUSAN LAWRENCE said that the Minister of Health had long wanted this scheme. He projected it in 1925, but it was so unpopular that it had to be dropped. He had introduced a much more unpopular Bill now which was tacked on to the Budget. He would not go down to posterity as a reformer of local government, but as a man who had tried to break up the fabric of local government and who had left the work of repair to others.

Mr. ERNEST EVANS said that the great maternity and child welfare services were new services, and there were still a good many people who required to be more firmly convinced of their value. There was no doubt that the percentage grant had been a great stimulus to expenditure on social services in the past. Under this Bill that stimulus would be checked. The result might be that services of this character would be curtailed in the very districts where their maintenance was essential.

Mr. PETHICK-LAWRENCE said that the great objection of the Labour Party to the Bill was that it would starve the vital services relating to the human needs of the people. It was perfectly plain that local authorities would not be encouraged as they had been to expand their health services.

Viscountess ASTOR said that the Government had brought in a great measure of social reform. There was, however, one rather weak point in it, and she hoped later to move an amendment to take the maternity and child welfare services from the operation of the block grant, and keep them as they were now under the percentage grant.

Superannuation.

Mr. WILLIAM GRAHAM said that no scheme for the improvement of local government was likely to succeed unless they got an efficient, well-remunerated, and contented personnel in the local government service. He therefore urged in the interests of efficiency that the Government should complete the structure of superannuation for local government officers which was permissively built up in 1922. As to the changes which the Government proposed to introduce in the relationship of the National Exchequer to local rates, their scheme left untouched all the percentage grants in education, police, and port sanitary services. The plan of the Government, while ostensibly aimed at the percentage grant, or, on the other hand, at the block grant, really achieved nothing of the kind. He believed an alternative could be found within an improved and more efficient percentage system. There was no validity in the argument that the State did not know and could not determine its own contribution to local services from year to year. Everything that was done by the State in that respect was done in terms of Act of Parliament. There was considerable departmental control, and Treasury and Parliamentary supervision. Efficient return for the State's contribution to local services could be obtained under the percentage system.

Sir BOYD MERRIMAN, Solicitor-General, replying to the points raised in the debate, said that both the amendments of the two Opposition parties did less than justice to the Government's proposals for the administration of the poor-law by the abolition of the guardians and the coöption of those who had experience of the administration of the poor-law. When it was thought that the Government were really going to confine this reform to the substitution of the county councils for the guardians, they were told that they were substituting administration by soulless officials of the county council for the local and personal touch. But now when they looked at the amendments, and the Government's proposals were known, and they had provided for the coöption of those with local knowledge and the personal touch, they were told that they were introducing the vicious practice of non-elected persons, as if they were a new thing in local government. He contended that the formula did take account of the main factors in the present inequality, and that it distributed the money in a proportion which increased as the years went on so as to give effect to the vital necessities. The Government believed that the scheme was going to benefit not only industry but all who were dependent upon industry and all the inhabitants of the country.

The Percentage Grants.

Mr. SIDNEY WEBB said that the Bill did not abolish percentage grants, which at present amounted to between £35,000,000 and £40,000,000 a year. The percentage grants which the Minister wanted to abolish [illegible] to about £4,000,000 a year, consequently nine-ten[illegible] grants would still exist. Derating would [illegible] of other grants, but £12,000,000 of that £16,000,000 were block grants already, therefore the Minister was not substituting £16,000,000 of block grants for percentage grants. He was changing the conditions of £12,000,000 of block grants into new block grants, and incidentally and wantonly abolishing £4,000,000 of percentage grants, which were of the highest utility. The abolition of the £4,000,000 of percentage grants would be seriously adverse to the further development of the optional services. The only provision in the Bill to prevent any backwardation was that which enabled the Minister or the county council to survey the grants, but there was no provision for the Minister's interference at all except in regard to public health. The Minister would not wish to see the progress of maternity and child welfare services stopped in those counties, but it would be stopped because the block grant to the local authorities was coupled with no conditions that they should spend some of it on maternity and child welfare.

With regard to the poor-law proposals, it was very good that Mr. Chamberlain should at last have abolished the statutory ad hoc destitution authorities. The evils of boards of guardians was that they were limited to the relief of destitution; they could not step in before destitution had begun in order to prevent it, and they could not go on a single moment after destitution had ceased in order to prevent a relapse. They were circumscribed in all sorts of ways in what they did. The right hon. gentleman did not sweep that away; he had abolished the boards of guardians, but he had not abolished the poor-law. The local authority was told to recover the cost of maintenance and treatment in institutions. It was provided that the bill to be sent to each patient was the average daily cost per day per patient of the entire institution. Suppose there was a hospital provided for the treatment of a considerable number of patients, and that it happened that there was so little sickness that there was only one patient in the hospital, was the whole cost of the hospital to be charged to that one patient? In any case, the average daily cost per day per patient would be enormous. Take the radium treatment of women for cancer. There might be only eight women under treatment, and in that case the average cost would represent a very large sum indeed. Clause 13 made it obligatory on the local authority to make a charge which included treatment. Surely the threat of being presented with an immense bill would deter poor persons from seeking treatment in these institutions. It had been suggested that this perfectly extortionate charge might be made, but that it would not be pressed. But let the Minister inquire of any medical officer how that would operate. What about the fear of the charge? The Minister wanted these people to come into these institutions before they were destitute; he wanted the poor man suffering from rheumatism to come in before he was broken down and unable to go to work; he wanted the cancer case to come in at the very earliest moment when there was no incapacity, and yet apparently he was going to require the institution to present to every patient a bill of this immense size. He (Mr. Webb) could only imagine that the Minister was paying regard to the susceptibilities of the voluntary hospitals, and that they were afraid that these public health institutions would be so good that people would not want to go to the voluntary hospitals. The Minister had better make haste to agree with his adversary while he might and accept Lady Astor's suggestion to let the maternity and child welfare grants go on.

Parliamentary Secretary's Reply.

After further debate,

Sir KINGSLEY WOOD (Parliamentary Secretary to the Ministry of Health) said that the Government were well satisfied with the result of the debate. This Bill was certainly the most important contribution to local government reform which had been made in our time. The great vice of the percentage system, especially from the point of view of the health services, was not only that its distribution was flagrantly bad, but that it was haphazard and unscientific. Wigan, for example, received one and a third times the amount that Blackpool got for its health services, but Merthyr Tydvil received not much more than nine-sixteenths of the amount that went to Southport. Surely it was a greater approach towards fairness that under the new formula the gain to Wigan would be six times that of Blackpool, and the gain to Merthyr Tydvil six times that of Southport. He was particularly concerned with the natural anxiety which had been expressed by many good friends of the maternity and child welfare movement. It was an extraordinary thing that under the present percentage system an authority must spend money before it could receive grants. Under the new system it would receive grants in order to be able to spend money. Take the maternity and child welfare services at Gateshead with rates of 23s. 9d. in the £ and 14,000 children, and South Shields with rates of 18s. 2d. in the £ and 13,500 children. They each received an approximate grant under the maternity and child welfare services of £1600, whilst Bournemouth, with rates of 8s. 2d. in the £ and only 5300 children, and Eastbourne, with rates of 9s. 4d. in the £ and only 2976 children, received nearly £2900 and £2700 respectively. That was the result of the present system. Hon. Members would allow that there was an improvement under the new arrangements, and the Government were perfectly open to receive suggestions for their improvement. He wished the House to know that at the present moment the Ministry of

Health were helping the local maternity and child welfare centres to the extent of £178,000 a year more than was done when the Labour Government were in office. If hon. Members would examine Clause 13 they would see that there need be no apprehension that people would be confronted with heavy bills for treatment. As a matter of fact, all they were doing was to follow out the system of the voluntary hospitals of the country.

On a division the Labour Party amendment was negatived by 344 votes to 165—Government majority 179.

The Bill was read a second time.

The Financial Resolution.

On Thursday, Nov. 29th, the House went into Committee on the financial resolution in connexion with the Local Government Bill.

In the course of the discussion, Dr. VERNON DAVIES said that he would like to impress upon the Committee that the figures they were discussing were based upon a hypothetical foundation, and that it was possible when the figures for the "standard" year were brought out they might be very much better or worse than those shown in the White Paper. Various associations had felt it necessary to criticise in some form or other some of the financial provisions of the Bill, but he found that a very important class of local authorities, the urban district councils, had not yet had their case presented to the Committee for consideration, though that case was of great importance. At present the rating resources of the local authority were elastic, inasmuch as they could be expanded when more money was needed, or contracted when less money was needed. The system up to the present had proved ideal from their point of view. They recognised that variations must of necessity take place throughout the country, but each urban district naturally was very anxious that it should not be their particular authority which might have to suffer. Even the population grant was variable; it might increase, remain stationary, or diminish, so that whereas local authorities had now a single elastic system of revenue they would under the Bill have two systems, one elastic and capable of expansion, and the other perhaps non-elastic and capable of no expansion at all. That meant that in the course of time some of these local authorities were bound to lose money. The loss for the first year would be reimbursed, but at the end of the 15 years they would reach the definite position that certain local authorities would be worse off than they were now. It was clear that unless such districts got some help they would be faced with the alternative either of putting an additional burden on the remaining ratepayers, which they might not be able to bear, or of abandoning a necessary or perhaps a vital service which they might have been able to carry out, and would have carried out, if it had not been for the effect of this Bill. The object of the Bill was not to cripple a district, or to restrict its resources, but to maintain them and further to see that they might have increasing resources to meet increasing needs. He hoped that the Government would give some hope or consolation to these urban district councils, and perhaps offer some suggestion which might relieve them of some of their anxiety. The British Social Hygiene Council now got a grant from the State, but under this Bill they would get no such grant. They would be dependent upon grants from the county authorities, but past experience was not very hopeful in this respect, for the county councils and other local authorities had not seemed very anxious to spend money in that direction. If it was possible he hoped that their case might be dealt with because it would be of great benefit to the health services. He was in favour of the block grant for health services. They had reached the stage when people knew the value of the welfare services, and all the authorities who were willing or anxious to avail themselves of those services had done so. Therefore, if they established a system of block grants a larger sum of money would be available, and the result would be that there would be a larger number of welfare centres throughout the country and a good general average of efficiency instead of, as at present, super welfare centres in some places and none at all in others.

Minister's Reply.

Mr. CHAMBERLAIN, replying to points raised in the debate, said that so far from reducing the State assistance to local authorities the Government scheme would increase it from 35 to 45 per cent. of total expenditure. Moreover, if rate-borne expenditure went up the block grant would also go up. The possible increase of the total Exchequer contribution was not limited to £2,000,000 per quinquennium, but might be any figure that Parliament thought it right to fix. The scheme began by giving a larger grant and provided that every fresh need should attract still more at every revision.

Mr. SCURR moved an amendment to the resolution raising the issue that contributions in aid of health services should be by way of percentage grant rather than by block grant.

Sir KINGSLEY WOOD, in opposing the amendment, suggested that the better course for Members who desired to raise the question of the percentage system would be to do so at a later stage.

The amendment was negatived by 285 votes to 122—Government majority 163; and the resolution was afterwards carried by 280 votes to 132—Government majority 148.

LOCAL GOVERNMENT (SCOTLAND) BILL.

In the House of Commons on Monday, Dec. 3rd, Sir J. GILMOUR (Secretary of State for Scotland), in moving the second reading of the Local Government (Scotland) Bill, which, in the main, seeks to achieve in Scotland similar objects to those aimed at by the English Bill in England, said that larger units of local government were required, particularly in view of the de-rating proposals. There were glaring inequalities and differences in the burdens which local authorities had to bear. 77 per cent. of the present pauperism in Scotland was in 37 parishes in the larger burghs, and 23 per cent. was scattered over 832 parishes. In the large parishes the cost of administration was about 3 per cent., while in many parishes it was 18 or 20 per cent. of the amount spent in relief. The small authorities were obviously unable of themselves to supply adequate and up-to-date hospital accommodation. The first part of the Bill dealt with local government administration. The services affected by the changes proposed included the poor-law and the major public health services, among which were hospitals and town-planning. It was proposed to set up new authorities as units of administration, consisting of the counties and the burghs of a population of 20,000 and over. The parish councils would be abolished. The administration of poor relief, by far the most important function of the parish councils, was to be transferred to the county. It was proposed that there should be a Statutory Committee dealing with the question of the poor-law within each county to which would be added by co-option persons who were conversant with these problems. For the purposes of the Bill the small burghs were those with a population of under 20,000, and certain of their functions would be transferred to the county councils. Those functions would include the major health services (including infectious disease and maternity and child welfare), milk and dairies, adulteration of food and drugs, unsound food, and town-planning. The total amount of rate loss due to de-rating was estimated in Scotland to amount to £3,200,000 a year. The total cost to the Exchequer in each of the first five years was estimated at £4,125,000. The total extra revenue to local authorities in each of the first five years—new money—was £922,000. The same guarantees were being given to Scotland as in England and the effect broadly of the guarantees would be that in the first quinquennium only three counties out of the 33 would require an additional grant to bring the gain up to 1s. per head to compensate them for the loss of rate and grant. No large burgh would require an additional grant, the amount of the gain in every case being in excess of 1s. per head. The new money being distributed—£922,000—represented a sum of 3s. 9¼d. per head of the population, and it was estimated to be equal to a rate of 6¼d. in the £ on the reduced rateable valuation of Scotland. Of the smaller burghs 115, or 84 per cent., would have their rates reduced, and of the 869 parishes 585, or 67 per cent., would have their rates reduced. It was calculated that every industrial area would gain and in addition seven out of every eight persons would gain.

An Amendment.

Mr. JOHNSTON moved the following amendment:—

That this House declines to assent to the second reading of a Bill which, [illegible] test of local governing bodies in S[illegible] foundations of local governmen[illegible] on of unrepresentative persons; d[illegible] n administration, and creates a [illegible] perpetuates the indefensible sy[illegible] as a local and not a national r[illegible] is calculated to hinder necessary developments in the public health services; and will add burdens to already harassed tenants and shopkeepers, while relieving wealthier sections of the community of their proper share of financial responsibility for local government.

The Bill, he said, was more drastic, more reckless, more desperate, and deadly in its attack on local government than the English Bill.

Dr. DRUMMOND SHIELS strongly opposed the Bill, which he said, presented great dangers to the public health services in Scotland. The block grant would adversely affect those services, which were rapidly developing.

Child Welfare.

Referring to the manner in which the child welfare movement had extended, he said that in Edinburgh in 1917, when it was first started, the net expenditure was £35,000. In 1920, before the amalgamation with Leith took place, the expenditure was up to £85,000, and now in the larger area the amount was £115,000 of health expenditure as compared with £35,000 only 11 years ago. This development was also only the beginning of a larger service in view

of the problems facing local authorities to-day. For instance, the question of the rheumatic child had been tackled by the London County Council and also by Birmingham. Another important service was the treatment of crippled children, 75 per cent. of whom could be made self-supporting if they were properly treated in the earlier years. There was the question of mental deficients in regard to which public opinion was now being roused. To give special education to mental deficients up to the age of 16 and then to throw them out without any further public supervision unless in the case of certifiable persons was simply to invite disaster both to them and to the community. There was also the subject of cancer. Something might be discovered at any moment in connexion with cancer, and even just now it was being realised that supplies of radium, which were very expensive, were essential in the treatment of that problem. Child welfare and maternity work was ripe for a very big advance and public opinion was ripe for that advance. They had been hearing a great deal of talk about maternal mortality. Dr. Findlay, the child welfare officer of Edinburgh, had pointed out that in 1927 in Edinburgh the figures of the maternal death-rate among mothers who had no antenatal attention were 11·2 per 1000 confinements, while in the antenatal clinics it was only 2·4. The total figures were not large enough for the actual scientific determination of these proportions, but it was plain that as Dr. Findlay said, they must conclude that the antenatal clinics very definitely assisted in lessening the maternal death-rate. There was not enough of this work to cover the field either in Edinburgh or elsewhere in this standard year. This year was the standard year, and it was going to determine the relative proportion of money to be given in the grants for the next five years. Therefore if the extension of this service was proposed in Edinburgh and other places—there were already schemes for homes and for other things to deal with these cases—the person responsible for the finances would say, "No, we cannot go on with that now. We have got our grant on the basis of this year's expenditure. We must wait until the fourth year, until the next standard." He did not think that that was a satisfactory position for the health services, and it seemed to him that the 6¼*d.* which the right hon. gentleman told the House was going to be saved in rates, or given as a present by this Bill, would very soon be wiped out by the inevitable increases in expenditure, which would result from the normal development after this year, and which would have to be met on a very narrow rating basis and would certainly cause an increase in the rate.

Venereal Disease.

The same thing applied in regard to venereal disease. At the present time the State paid 75 per cent. and the local authority paid 25 per cent. Now the local authority was to pay the whole 100 per cent., and while it was likely that large cities like Edinburgh would maintain their service, there would be no stimulus to those backward areas which had never provided any efficient V.D. service to pass the standard year and to go forward and impose on their own ratepayers the charge for the necessary extension of those services. The Government had taken up a very strong line in regard to what the Edinburgh authorities put forward for compulsory treatment in venereal disease. They had turned that down. At the same time in this Bill they had cut out the grant for propaganda. If the voluntary system was to be successful in venereal disease, propaganda was absolutely essential and propaganda must be national, because voluntary contributions had been tried before and had been entirely unsuccessful. Such things as films and various items could not be supplied by individual authorities but must be done nationally. This had all been cut out by this Bill. Some people had said that they looked forward to this Bill as a great help for public health. He wished he could think so. He thought that it was a backward measure and that it was going to be a terrible danger to public health. It was not going to be maintained, and if it was it would only be by the sacrifice of local authorities in rating their own people rather than let the services suffer.

Scottish Hospitals.

There was one last word with regard to hospitals. He would like to have information about that, because the point had never been cleared up. Under this Bill the town councils were going to take over institutions such as the large hospitals in the cities which at present were run by the parish councils. They had two hospitals in Edinburgh—Craiglochart and Craigleith. It was proposed that all the poor people would be taken from Craiglochart and kept in Craigleith which had been restored to them after the war pensioners had used it. He thought Craiglochart ought to be used as an overflow for the Edinburgh Royal Infirmary, which had a waiting-list of over 2000 with many urgent cases wanting to get in. What was to be the position? Was it the case that Edinburgh Town Council would only be able to treat in that hospital necessitous poor, and would Edinburgh be compelled to get back from the relatives of these people so treated any sum expended on their maintenance? In Aberdeen at the present time there was a working arrangement and the parish council hospitals had been handed over to the public health committee of the town council and were being worked by them. In Glasgow there was a working arrangement with Stobhill, one of the best fitted-up hospitals in the country. What was going to be the new position? Did the new proposals compel the town council to treat the people in those hospitals, if they were intending to use them as general hospitals, differently from the people in the tuberculosis hospitals? That was a very important point, which he would like to see cleared up. Another point which was of some importance was that one of the advantages of the new proposal was that these new institutions which were taken over were going to be brought up to date. We know that many of the poor-law institutions were out of date and badly equipped. Who was going to pay for bringing them up to the proper standard of equipment? He hoped that no considerations of any kind would prevent every facility being given and every accommodation being taken advantage of for the medical services of people who required it. He thought there would be opposition from those people who believed that a well-equipped and well-run municipal hospital would tend to damage the voluntary hospitals of the district. He believed, however, that for many years there would be plenty of room for both of them, and he hoped that the municipal authorities would be encouraged to use those institutions to the utmost capacity. He would like also to know what was going to happen to the Highlands and Islands Medical Fund.

Reply on the Debate.

The debate was resumed on Tuesday, Dec. 4th.

Major ELLIOT (Under Secretary of State for Scotland), replying to points raised in the debate, quoted from reports and speeches delivered by prominent Members of the two Opposition parties in support of local government reform, the abolition of parish councils, and the transfer of their functions to the town councils and county councils. He contended that the scheme had been very fully discussed in Scotland, especially by the municipality of Glasgow which contained a large number of Socialist members, and there was no suggestion of party opposition to the measure on the part of the Socialist members of the Glasgow Corporation. He hoped, therefore, that they had heard the last of the accusations that the scheme had been brought forward without any previous consideration or discussion, and that its proposals were of an undemocratic and bureaucratic character. Proposals were included in the Bill to secure that there should be working-class representation on the new bodies to be set up. The Bill was not a backward step, but a step forward in that respect. Committee after committee had reported in favour of the movement of the health services from the education authority to a single health authority. The Bill would put the five great semi-national services of Scotland—the roads, public health, education, poor-law, and police services—on the widest possible bases.

The amendment was rejected by 319 votes to 150, and the Bill was read a second time.

SITUATION IN DISTRESSED AREAS.

In the House of Commons on Monday, Dec. 3rd, Mr. CHAMBERLAIN, replying to requests by Mr. LANSBURY and Mr. MORGAN-JONES that the Government should take action to deal with the position in the distressed areas, said that a fortnight ago he sent his chief inspector to South Wales, accompanied by a competent medical man, to make a thorough investigation on the spot and to go into the homes of the people. The inspector was being assisted by people on the spot who had taken a special interest in the matter. He (Mr. Chamberlain) hoped before long to receive a report which would show him more accurately than anything he had hitherto been able to get of the situation in that area. When he got that report he would take very serious thought as to what might arise out of it.

HOUSE OF LORDS.

TUESDAY, DEC. 4TH.

Voluntary Boarders in Public Asylums.

Lord SANDHURST asked if the Government would in the present session introduce legislation to enable voluntary boarders to be received into public asylums.

The Earl of CRANBROOK urged that legislation should be introduced, both on the grounds of economy as well as of humanity. He said that it would also be in the interests of the medical profession. Doctors would be able to study these cases in their early stages, and the treatment of mental disorder would be able to be linked up with general practice in a way which was not possible at present.

The Earl of ONSLOW said that there were difficulties in dealing with the recommendations of the Royal Commission on Lunacy separately, and the Government hoped to deal with them as a whole. It was impossible to introduce a comprehensive Bill this session, but the Government hoped to deal with the whole subject of lunacy and mental disorder as soon as possible. He assured their lordships that provision for the admission of voluntary boarders into public asylums would find a place in the proposed measure.

HOUSE OF COMMONS.

WEDNESDAY, NOV. 28TH.

London Poor-law Hospitals.

Lieut.-Colonel FREMANTLE asked the Minister of Health (1) what was the number of beds actually available in each poor-law hospital in London for the sick in wards staffed by trained nurses; (2) what was the actual number of beds in infirm wards served by untrained attendants in the poor-law institutions in London; (3) what was the number of trained nurses and untrained attendants, respectively, in the poor-law hospitals and infirm wards of the poor-law institutions in London.—Sir KINGSLEY WOOD replied: Wards for the sick and infirm in the separate infirmaries of London which are ordinarily staffed by trained nurses, probationers in various stages of training, and ward maids or attendants, contain 16,520 beds. Wards for the sick and infirm included in other poor-law institutions are usually staffed by trained nurses, assistant nurses, and attendants, and contain some thousands of beds. My right hon. friend regrets that no more precise figures for the number of beds or the number of nurses and attendants are available.

Milk Provision for Maternity and Child Welfare.

Viscountess ASTOR asked the Minister of Health if he would, at a proper time and early date, withdraw the cut which he made in the moneys granted for milk provision for the maternity and child-welfare services.—Sir KINGSLEY WOOD replied: I assume that my hon. friend is referring to the reduction of about £12,000 which was made in the grants available for certain local authorities in aid of their expenditure on milk during the present financial year. This reduction, which was purely temporary, had to be made in order to keep the grants paid by my department for the health services within the amount voted by Parliament. I may add that similar action will not require to be taken during the next financial year.

Sexual Offences Against Young Persons.

Viscountess ASTOR asked the Home Secretary what steps had been taken to carry out the recommendations of the Departmental Committee on Sexual Offences against Young Persons, which reported in December, 1925, and also those of the Departmental Committee on the Treatment of Young Offenders, which reported in March, 1927, other than those covered by the Home Office circulars issued on Sept. 30th, 1927, and July 20th, 1928.—Sir W. JOYNSON-HICKS replied: It would be impracticable in the course of an answer to a Parliamentary question to refer in detail to the various matters dealt with by the two committees, which, as my noble friend is aware, covered a very wide field. A new report of the Children's Branch will be issued in the course of a few days, and this will give some account of the progress made. The two circulars mentioned dealt fully with many aspects of the subject of young offenders, including the important questions of the organisation of juvenile courts and the use of hostels and houses in connexion with the probation system as an alternative to imprisonment, and showed how much could be done by the justices under their existing powers. I understand that in many places the justices have carefully considered these circulars, and have arranged to modify their practice in accordance with the recommendations. A circular was issued to justices on Sept. 17th, 1926, as regards the recommendations of the Sexual Offences Committee, and I am considering, with the aid of the best advice I can obtain, whether it would be right at a suitable opportunity to propose changes either in law or in the practice of the Higher Courts in some of the many directions indicated by the Committee. As to those recommendations which cannot be carried out without legislation, the Government is most anxious to introduce a Bill to amend the Children Act as soon as Parliamentary time can be found.

THURSDAY, NOV. 29TH.

Glassworkers' Cataract.

Mr. WARDLAW-MILNE asked the Home Secretary whether his attention had been called to cases of glassworkers' cataract resulting in total disablement; and, if so, whether he would consider extending the provisions of the Workmen's Compensation Act Order (S. R. and O. 1916, No. 287), as amended by S. R. and O. 1923, No. 6, so as to put glassworkers in the same position as regards compensation as workers in iron and steel manufactures.—Sir WILLIAM JOYNSON-HICKS replied: I have recently had under consideration the desirability of amending the existing provisions as to glassworkers' cataract on the lines indicated in the question, and have asked the Glass Manufacturers' Federation if they desire to offer any observations. I will inform my honourable friend of the result in due course.

Importation of Indian Opium.

Mr. WELLOCK asked the Home Secretary whether it was now the policy of the Home Office to import opium from India in the form of manufactured alkaloids; whether such alkaloids were instead of, or were in addition to, the medical opium habitually imported from India; and whether he could give an assurance that there had not been and would not be an increase in the amount of opium imported, whether as medical opium or as alkaloids.—Sir WILLIAM JOYNSON-HICKS replied: During the past four years both raw opium and crude morphine have been imported into this country from India for the purpose of manufacturing drugs. They have taken the place to a considerable extent of opium imported from other countries. It is not possible for me to give such an assurance as is asked for in the last part of the question, as the amount of opium required for medical and scientific purposes, whether for use in this country or for export, necessarily fluctuates to some extent from year to year, but the honourable Member may rest assured that the trade is very carefully supervised and, in fact, there has been a progressive decrease in the amounts imported in recent years.

Block Grant and Maternity and Child Welfare.

Viscount SANDON asked the Minister of Health what was the gross amount and the average amount per local authority which would be gained to them annually under the head of maternity and child welfare services by the operation of the block grant as opposed to the percentage grant.—Mr. CHAMBERLAIN replied: The gain in grant of counties and county boroughs under the scheme will be general, and no specific part can be said to arise under the head of the maternity and child welfare service. As regards maternity and child welfare authorities other than counties and county boroughs, the addition to the general Exchequer grant of the authorities for the purpose of the maternity and child welfare services will be determined by a scheme to be made by the Minister according to the services to be carried out and the circumstances of the areas.

Public Instruction on Food Values.

Mr. BUXTON asked the Minister of Health whether he was aware of the public demand for information as to the purity of certain preserved foods; and whether he would issue statements giving guidance on the question of the comparative hygienic value of chilled or frozen meat and fresh meat and tinned and fresh fruit, respectively.—Mr. CHAMBERLAIN replied: I am glad to observe a growing public interest in the purity of food, and I will consider whether there is any information in regard to the points mentioned by the right hon. gentleman which it would be of advantage to publish.

FRIDAY, NOV. 30TH.

The Schick Test in London Boroughs.

Mr. DAY asked the Minister of Health which of the metropolitan borough councils had undertaken, with the sanction of his department, immunisation work by means of the Schick test for the purpose of reducing the attack-rate of diphtheria.—Mr. CHAMBERLAIN replied: The following metropolitan borough councils have, with the sanction of my department, undertaken immunisation work of the kind referred to: Battersea, Camberwell, Deptford, Finsbury, Holborn, Lambeth, Poplar, St. Marylebone, Stoke Newington, Wandsworth, and Westminster.

MONDAY, DEC. 3RD.

Nourishment for Children in Necessitous Areas.

Sir ROBERT THOMAS asked the President of the Board of Education how far local education authorities provided meals, milk, cod-liver oil, and malt extract, or other nourishment to children in the necessitous areas who were suffering from malnutrition and whose parents were not in a position to provide them with sufficient food: what authorities, if any, in the North and South Wales coalfields were so providing for the children; and, if the powers of the education authority clashed with those of the poor-law authority would he take steps to coördinate the functions of the two bodies.—The Duchess of ATHOLL (Parliamentary Secretary to the Board of Education) replied: At the present time approximately 120 local education authorities are providing meals or other nourishment for necessitous children. The authorities in the Welsh coalfields who are

undertaking such provision are Monmouth, Glamorgan, Cardiff, Merthyr, Newport, Swansea, Aberdare, Abertillery, Barry, Pontypridd, and Rhondda. Arrangements have been made for securing close coöperation between the education and the poor-law authorities.

Non-destitute Persons and Hospital Treatment.

Viscount SANDON asked the Minister of Health whether local authorities would have power, except in cases of infectious disease, to recover from the non-destitute expenses for treatment in their hospitals as well as for maintenance, to which he stated it was limited, in view of the terms of the last two lines of Subsection (3) of Section 13 of the Local Government Bill.—Sir KINGSLEY WOOD replied: Yes, Sir, to the extent of the average daily expenditure of the hospital on treatment, but not by reference to the actual cost of the treatment of the particular patient.

TUESDAY, DEC. 4TH.

Maternity and Child Welfare in Scotland.

Mr. ERNEST BROWN asked the Secretary of State for Scotland the total number of local authorities in Scotland empowered to make provision for maternity and child welfare; and the number of such authorities that made such provision in 1927–28 or to the latest available date.—Sir J. GILMOUR replied: There are 307 public health local authorities in Scotland, all of whom have powers under Subsection (1) (*b*) of Section 3 of the Notification of Births (Extension) Act, 1915, subject to the approval of the Scottish Board of Health, to make arrangements for attending to the health of expectant and nursing mothers and of children under 5 years of age. The number that have made such provision up to date is 243.

Births, Marriages, and Deaths.

BIRTHS.

RODD.—On Nov. 25th, at Yelverton, Devon, the wife of Captain Arthur Rodd, late R.A.M.C., of a daughter.

SHERIDAN.—On Nov. 28th, at Parkfield House, Didsbury, Lancs., the wife of Major B. C. O. Sheridan, M.C., R.A.M.C., of a daughter.

WAY.—On Dec. 4th, at 923, Finchley-road, N.W.11, to Phillis (*née* Pelissier), wife of Dr. C. Berkeley Way, *M.C.*—a daughter.

DEATHS.

CLARK.—On Nov. 30th, at College-gardens, Dulwich, John Thomson Clark, M.B., Ch.B., D.P.H., aged 56.

HORT.—On Nov. 27th, 1928, at Saigon, French Indo-China, Violet Gordon Hort, eldest daughter of the late Edward Collett Hort, F.R.C.P. Ed., formerly of 8, Harley-street, W., and of Mrs. Hort, of Seaford, Sussex.

KERR.—On Nov. 26th, at 1, Claremont-place, Sheffield, William Smith Kerr, M.B., C.M., F.R.C.S. Ed.

MACGREGOR.—On Nov. 27th, at Orchard Bank, South Promenade, Lytham St. Annes, after a long illness, John MacGregor, M.D., L.R.C.P. & S. Edin., M.R.C.S. Eng.

NESBITT.—On Dec. 1st, suddenly, at Hilgay, Norfolk, James Nesbitt, L.R.C.P., L.R.C.S. Edin., aged 68.

STEWART.—On Dec. 2nd, at Burleigh-mansions, Charing Cross-road, W.C., James Stewart, F.R.C.P. Edin., L.R.C.S.I., L.M. Dub.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

SNAKES OF CENTRAL AMERICA.—The United Fruit Company is coöperating vigorously in the development of antivenines throughout Central America. Section V. of the sixteenth annual report, to which we have already referred, is devoted to snakes and snake-bite. There is a curious scarcity of trustworthy data concerning the snakes of this region and the effects of their bites. Hence, at Tela, Honduras, a serpentarium has been organised, and here Dr. T. Barbour has reported on 3349 specimens, a collection which contained 31 species of harmless snakes (2746) and four species of poisonous snakes (603 specimens), and of these 352 were the dreaded fer-de-lance (*Bothrops atrox*). The capture of these thousands of snakes did not result in a single case of snake-bite, yet during this period ten cases of snake-bite were admitted to Tela Hospital, only two of which were serious enough to require antivenine treatment. Enough venom has now been collected and shipped to start the manufacture and distribution of fer-de-lance serum, and some information concerning the breeding habits of this species has been obtained. Its fecundity is remarkable. Photographs are shown of a female snake which produced a litter of 72 live young weighing in the aggregate 1·66 lb. The young fers-de-lance are active and venomous within 24 hours of birth when their average length is 13 inches and weight 10·5 g.

Obituary.

MICHAEL MARTIN DAVITT, M.B., B.Sc. N.U.I.

THE death of Dr. Michael Davitt occurred at Galway on Dec. 1st after a very short illness. Thirty-eight years of age, he was the eldest son of the late Michael Davitt, a well-known public man in Ireland and for a time a Member of Parliament. He was educated at University College, Dublin, taking the degree of Bachelor of Science in the National University of Ireland in 1911 and the degree of Bachelor of Medicine in 1914. In 1917 he was appointed visiting physician to Jervis-street Hospital, Dublin, but in 1919 relinquished this appointment and engaged in practice in Wales for some years. In 1922 he was appointed physician to the newly established Central Hospital in Galway, and soon afterwards became lecturer in clinical medicine at University College, Galway. Speedily gaining a reputation as a sound physician, he had for some years past enjoyed a growing consulting practice. He took an active part in public affairs, both local and national, and was nominated a candidate for the Senate for the election which was held this week, his return being considered certain. On Nov. 30th he felt unwell and complained of stiffness in the neck. The condition soon declared itself as tetanus, and he succumbed on the afternoon of the following day. It is stated that he had had a previous attack of tetanus two years ago. Dr. Davitt was a man of much ability and public spirit to whom a bright and useful future seemed assured.

MONTY BARANOV, M.D. LOND., D.O.M.S.

WE regret to announce the death at Johannesburg of Dr. M. Baranov, by which a promising career in ophthalmic surgery has been cut short. Born at Vryheid, Natal, in 1895, he was educated at King Edward VII. School, Johannesburg, matriculating in 1912 when he went on to University College, London, for his medical studies. He became a prosector in anatomy at the Royal College of Surgeons, took the Conjoint qualification in 1918, and acted as house physician to Dr. Bolton at University College Hospital. He graduated M.B., B.S. Lond. before going to France with a commission in the R.A.M.C. On his return he took the M.D. in general medicine while casualty officer at his hospital, and assisted Mr. Percy Flemming and Sir John Parsons with a view to proficiency in ophthalmology. He then entered Moorfields and rose to the position of senior house surgeon and chief clinical assistant, taking the Conjoint diploma in ophthalmology. Towards the end of 1923 he returned to South Africa, and in the following year was elected honorary assistant ophthalmic surgeon to the Johannesburg General Hospital, where he was actively at work until some six weeks before his death. He took a keen interest in his non-European work in which his fine operative ability soon made itself manifest.

Dr. Baranov possessed social gifts of a high order. On the testimony of one of his old teachers we learn that he was highly popular with the medical and nursing staff at Moorfields, and his popularity followed him to South Africa, where his qualities secured for him the confidence and affection of his colleagues. He was full of the joy of life in work and spent himself in care for his patients.

In December, 1926, Dr. Baranov married Miss Clara Rosenberg, of Johannesburg, and much sympathy is felt for his young widow.

Mr. E. C. Harries, headmaster of West Buckland School, Barnstaple, writes that Dr. William Hill was educated at this school and was a prominent member of the Old Boys Club.

Medical News.

UNIVERSITY OF CAMBRIDGE.—Dr. A. F. R. Wollaston has been re-elected to a Fellowship at King's College, and has been appointed tutor.

UNIVERSITY OF LONDON.—The Diploma in Psychological Medicine (with special knowledge of psychiatry) has been conferred, after examination, on Dr. Kathleen A. H. Sykes.

The Paul Philip Reitlinger Prize, offered this year for the best essay embodying the result of some research work on a medical subject carried out by the candidate, has been awarded to Geoffrey William Rake, M.R.C.S. Eng., a student of Guy's Hospital Medical School, for an essay on Achalasia of the Cardia. The prize, of the value of £30, was founded by Mr. Albert Reitlinger in memory of his son, a student of Middlesex Hospital Medical School, who died in 1911.

UNIVERSITY OF DUBLIN.—At recent examinations the following candidates were successful:—

FINAL EXAMINATION FOR M.B., B.CH., AND B.A.O.

Medicine.—*Arthur Geoffrey Thompson, *William John Edward Jessop, *Nora Adrienne Stack, Gerald Cecil Dockeray, Dermot Francis Walsh, Mollie Finegan, John Edward Cooper Cherry, John Ernest McMahon, John Terence McGinn, Ion Wellesley Pigott, Eric Francis Saunderson Morrison, and Charles Murrough O'Brien.

Surgery.—*Arthur Geoffrey Thompson, *Gerald Cecil Dockeray, Dermot Francis Walsh, William Rothschild Johnston, John Ernest McMahon, *Ernest du Plessis Meiring, *Nathan Shapira, Robert Ian Gillespie Reid, John Beggs, *Frederick Richard Falkiner, *Isaac Fisher Ratthaus, *Julius Horwich, *Cecil King, and *Frederic Severne Mackenna.

Midwifery.—*Lionel Brent Harris, *Thomas Brown M'Mahon, Geoffrey Berry Thrift, Charles Morrison Taylor, Rex St. John Lyburn, William Bruce Hamilton, Charles Murrough O'Brien, Robert Ivan Reid, Alleyn Henry O'Malley, Edward Bethel Andrade Solomons, Norman Sydney Klass, George Kenneth Graham, John Beggs, *Alan Francis Kennedy, *Patrick Alban Thornton, Frederic Severne Mackenna, and William Ivan Chapman.

FINAL EXAMINATION FOR B.DENT.SC.

Francis Bertram Sumerling and Michael Emanuel Mofsovitz.

* Passed on High Marks.

HOSPITAL SATURDAY.—The amount collected on Hospital Saturday, Oct. 6th, in London, was £2939.

OXFORD OPHTHALMOLOGICAL CONGRESS.—The following have been elected to hold office in 1929:—Master: Bernard Cridland. Deputy Master: Philip H. Adams. Hon. Treasurer: Robert J. Coulter. Hon. Secretary: C. G. Russ Wood, to whom communications should be addressed at 12, St. John's Hill, Shrewsbury. The next meeting will be held from July 4th to 6th, 1929.

ROYAL INSTITUTION.—A general meeting of the members of the Royal Institution was held on Dec. 3rd, Sir Arthur Keith, treasurer and vice-president, in the chair. Miss Edith Aird, Sir John Aspinall, Sir John Beale, Dr. R. T. Beatty, Miss K. Hartree, Viscount Hambleden, Mr. E. Hatschek, Mr. R. Hennell, Mr. C. W. G. Hindley, Mr. J. S. Oliver, Mr. R. Pigott, Miss L. Power, Mrs. E. A. Ronald, and Mr. C. Swithinbank were elected members.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.—At the annual meeting of the Court of Governors of the School, which was held on Nov. 30th in the Council Room of the B.M.A. House, Tavistock-square, Sir Holburt Waring being in the chair, substantial progress was reported in the organisation of the School and in the new building. The Director reported an increase of no less than 17 per cent. in the proportion of success among students sitting for the diploma in tropical medicine and hygiene. Advanced courses in bacteriology have been established in temporary quarters in Gordon-square, and all of the five students who entered for the new diploma of London University obtained it. Special courses in epidemiology and vital statistics have also been established. The professors of public health, of biochemistry, and of chemistry as applied to hygiene, who have already been appointed, will enter upon their duties next summer, when it is hoped that the handsome building in Portland stone which is being completed in Bloomsbury to the design of Mr. Morley Horder and Mr. Verner O. Rees will be opened.

Dr. H. R. Newham, C.M.G., the Warden of Studies, has been appointed also curator to the museum; and Dr. J. F. C. Heslam, director of library services, and Mr. R. L. Sheppard, assistant director of library services, and Mr. C. C. Barnard will retain his post of librarian in the new organisation.

CROSLAND MOOR POOR-LAW INSTITUTION.—Sir Berkeley Moynihan last week opened a new block of this institution belonging to the Huddersfield Board of Guardians. Four large wards and two smaller ones will accommodate 109 patients; the cost has been approximately £183 per bed.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—A meeting will be held at the Society's House, 17, Bloomsbury-square, London, W.C., on Tuesday, Dec. 11th, at 8 P.M., when Miss Katharine Coward, D.Sc., will give an address on Recent Research on the Vitamins, illustrated by lantern slides. Medical friends of members and student-associates will be welcomed.

RATES ON HOSPITALS.—The assessment of Finchley Memorial Hospital has been increased by 500 per cent. It is officially stated that since the enlarged assessment was the work of the Panel of Valuers the Valuation Committee felt obliged to accept it, but would fully support an appeal.—Alderman Kingston, deputy mayor of Brighton, where there have also been heavy increases in hospital assessments, last week suggested that the difference should be given back by the corporation. The assessment of the Sussex County Hospital has been raised from £100 to £1600.

BRITISH HONOUR FOR EGYPTIAN SURGEON.—At the Medical Congress to be held this month in Cairo, Sir Berkeley Moynihan, President of the Royal College of Surgeons of England, will admit Ali Bey Ibrahim, Professor of Surgery of the Faculty of Medicine of Cairo University, to the honorary fellowship of the College.

LORD BIRKENHEAD'S PENSION FOR HOSPITALS.—Lord Birkenhead announces that his pension of £5000 a year as an ex-Lord Chancellor is, less income-tax, to be placed in the hands of trustees "in favour of certain approved and contingently selected hospitals."

PAYING PATIENTS AT GLASGOW.—A new wing is to be added, at a cost of £25,000, to the Victoria Infirmary, Glasgow, for the reception of paying patients. It will accommodate about 30 patients who will pay an inclusive fee of £6 6s. per week for the first three weeks, and £3 3s. per week thereafter.

MOTORISTS AND HOSPITALS.—The Royal Victoria Infirmary, Newcastle-on-Tyne, has received a cheque for £500 subscribed by 4000 motorists which has been added to the motor section of the Infirmary Appeal Fund. It is officially stated that there is a ward constantly full with motor accident cases, and that the cost of treating them is about £5000 a year.

ILLEGAL USE OF FORMALIN TO PRESERVE MEAT.—A butcher and his assistant were recently fined rather heavily at Mortlake for treating meat with formalin. The summonses were in respect of shin of beef, stewing steak, and scrag of mutton, showing that the defendants used the preservative in a rather wholesale way. Mr. E. Hinks, public analyst for Surrey, testified to the presence of formaldehyde in all three samples, a fact that was not disputed by the defendants who pleaded guilty. They did not know, they said, that formalin was harmful; they had used it to prevent the meat "going clammy" over the week-end. The prosecuting solicitor opined, in answer to a question from the bench, that there was not a butcher in the kingdom who did not know that formalin must not be used in that way. This is the first prosecution of the kind in Surrey, and it raises the question to what extent this practice is followed by butchers. We know that the official organisations of the trade disapprove of the use of preservatives, but it is not unlikely that individual traders find that wiping over or spraying with formalin gives meat a fresh appearance and so use it. Medical officers and public analysts in other places than Mortlake would do well to make investigations to see whether this very objectionable practice goes on in their districts. It is possible that the majority of people could eat meat treated with formalin for years, as indeed one of the defendants said he had done, without any obvious ill-effects, but there are many who without being exactly invalids are not well equipped physically for incurring the risks of malnutrition and indigestion which "doped" foods necessarily present. Besides this, practices of the kind under consideration greatly complicate all questions of diagnosis and diet in ailments of the digestive organs.

THE LANCET: SUBSCRIPTION RATES.

INLAND	One Year	£2	2	0
	Six Months	1	1	0
	Three Months	0	10	6
ABROAD	One Year	2	10	0
	Six Months	1	5	0
	Three Months	0	12	6

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, Dec. 10th.—5 P.M., WAR. Paper: Surgeon-Commander P. M. Rivaz, R.N.: Some Common Problems in Naval Hygiene.

TUESDAY.—5.30 P.M., THERAPEUTICS. Paper: Prof. E. B. Verney: The Purines as Diuretics. A discussion will follow. 8.30 P.M., PSYCHIATRY. Paper: Dr. W. A. Potts: Delinquency.

WEDNESDAY.—5 P.M., HISTORY OF MEDICINE. Tercentenary of Malpighi. Paper: Prof. Franchini (Bologna): Malpighi. Members are invited to bring objects (books, prints, documents, instruments, medals, &c.) of historical interest for exhibition at the meetings of this Section.

THURSDAY.—8.30 P.M., NEUROLOGY. Short Papers: Dr. Parkes Weber: A Note on the Association of Extensive Hæmangiomatous Nævus of Skin, with Cerebral (especially Meningeal) Hæmangiomata. Dr. J. G. Greenfield: Measles Encephalitis. Dr. R. M. Stewart: The Pseudo-polyneuritic Type of Amyotrophic Lateral Sclerosis.

FRIDAY.—5.30 P.M., CLINICAL. (Cases at 5 P.M.) Cases: Dr. C. Worster-Drought: A Case of Bullet in Brain for 13 Years. Dr. F. G. Chandler: A Case of Oleothorax. Mr. W. E. Tanner: Bilateral Central Osteomyelitis of Humeri Following Puerperal Sepsis. Dr. B. S. Nissé: A Case of Congenital Heart Disease with Arborisation Block. Dr. Bernard Myers and Mr. St. J. D. Buxton: A Case of Severe Rickets. Dr. J. D. Rolleston: Cases of Tracheotomy for Laryngeal Diphtheria in Mother (1896) and Daughter (1928). Dr. F. Parkes Weber: Post-mortem Specimen from Case of Stenosis of the Aortic Isthmus shown before the Section on Oct. 12th, 1928. Other cases will be shown. 5 P.M., OPHTHALMOLOGY. Clinical Meeting, at the Royal Westminster Ophthalmic Hospital, Broad-street, Holborn, W.C. (nearest tube stations—British Museum and Tottenham Court-road). Tea at 4.30 P.M. 8.30 P.M., ELECTRO-THERAPEUTICS. Paper: Dr. C. A. Robinson: The Treatment of Pelvic Inflammation by Diathermy.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

MONDAY, Dec. 10th.—8.30 P.M., Discussion on Sacro-iliac Pain, to be introduced by Dr. Wilfred Harris, Mr. P. J. Verrall, and Dr. James Brailsford.

BIOCHEMICAL SOCIETY.

FRIDAY, Dec. 14th.—5 P.M. (in the Laboratories of J. Lyons and Co., [illegible] ...ngton), the following [illegible] C. Drummond and [illegible] Studies of the Vitam[illegible] B. Russell-Wells and P. Haas: The Hydrolysis of Carragheen Mucilage. C. R. Harington: The Resolution of Di-thyroxine. M. W. Goldblatt: The Action of Insulin in Young Rabbits. E. Clenshaw and I. Smedley Maclean: The Nature of the Unsaponifiable Matter from the Lipoids of Spinach and Cabbage Leaves. L. H. Lampitt and P. Bilham: The Effect of Some Constituents of Milk on its Hydrogen-ion Concentration. D. H. F. Clayson: The Diastatic Digestion of Raw Wheat Starch. L. H. Lampitt and J. B. Bushill: Some Observations on the Determination of Surface Tension (by the Ring Method) with Special Reference to Egg Albumin. E. B. Hughes: Some Observations on the Production of Liesegang Rings. J. Pryde and E. T. Waters: The Nature of the Sugar Residue in the Hexosemonophosphoric Acid of Muscle. O. Rosenheim and T. A. Webster: The Biological Inertness of Irradiated Mycosterols other than Ergosterol. O. Rosenheim: A Specific Colour Reaction for Ergosterol.

ROYAL SOCIETY OF TROPICAL MEDICINE, 11, Chandos-street, Cavendish-square, W.

THURSDAY, Dec. 13th.—8.15 P.M., Dr. A. Knyvett Gordon: The Rôle of the Spleen in the Causation of Hæmorrhage. Preceded at 7.45 P.M. by a demonstration.

ROYAL SOCIETY OF ARTS, John-street, Adelphi, W.C.

WEDNESDAY, Dec. 12th.—8 P.M., G. G. Blake, M.I.E.E.: Application of Electricity to Medical Practice.

HARVEIAN SOCIETY.

THURSDAY, Dec. 13th.—8.30 P.M. (at the Paddington Town Hall, Harrow-road), Mr. A. E. Giles: Sterility and its Treatment. There will be a discussion after the paper.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, Dec. 10th.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Simmonds: Surgical Out-patients.

TUESDAY.—11 A.M., Mr. Endean: Venereal Diseases (demonstration). 2 P.M., Dr. Shaw: Medical Out-patients. 2 P.M., Mr. Hamblen Thomas: Throat, Nose and Ear Department.

WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. 2 P.M., Mr. Tyrrell Gray: Operations. 2.30 P.M., Mr. Donald Armour: Surgical Wards.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 2 P.M., Dr. Ironside: Medical Out-patients. 2 P.M., Mr. Bishop Harman: Eye Department.

FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department.

SATURDAY.—9 A.M., Mr. Vlasto: Operation on Throat, Nose and Ear. 9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Diseases of Children.

Daily 10 A.M. to 5 P.M., Saturdays 10 A.M. to 12 noon. Medical and Surgical In-patients and Out-patients. Operations, Special Departments, Anæsthetic Course.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Dec. 10th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, Dec. 11th.—5 P.M., Dr. S. E. Dore: Erythemato-squamous Eruptions.

THURSDAY.—5 P.M., Dr. W. N. Goldsmith: Pigmentation of the Skin.

LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.

FRIDAY, Dec. 14th.—4 P.M., Mr. Nicol Rankin: Earache.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.

WEDNESDAY, Dec. 12th.—4 P.M., Prof. E. W. Hope: Industrial Diseases as Viewed from the Standpoint of a Medical Officer of Health.

NATIONAL INSTITUTE FOR THE DEAF.

TUESDAY, Dec. 11th.—8 P.M. (at Eustace Miles Restaurant, 40, Chandos-street, W.), Mr. C. M. R. Balbi, A.M.I.E.E.: Facts on Deafness. Silver collection.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, Dec. 11th.—4.15 P.M., Dr. J. Wharton: Demonstration of Ophthalmological Cases.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.

FRIDAY, Dec. 14th.—3.30 P.M., Dr. Wilkie: X Rays in the Diagnosis of Gastro-Intestinal Lesions.

Appointments.

YELLOWLEES, H., M.D. Glasg., F.R.F.P.S. Glasg., F.R.C.P. Edin., has been appointed Physician for Mental Diseases to St. Thomas's Hospital.

Certifying Surgeons under the Factory and Workshop Acts: ELKINGTON, G.W., M.B., B.S. Lond. (Bruton, Somerset); PHILIP, P. W., M.B., Ch.B. Aberd. (Huntly, Aberdeen); PHILLIPS, D. B., L.R.C.P. Lond., M.R.C.S. (Loughor, Glamorgan); and SELBY, H. J., L.R.C.P. Lond., M.R.C.S. (Newnham, Gloucester).

Vacancies.

For further information refer to the advertisement columns.

All Saints' Hospital for Genito-Urinary Diseases, 91, Finchley-road, N.W.—Sen. and Jun. H.S.'s. At rate of £200, £150, and £100 respectively.

Bihar, India, Jharia Mining Settlement.—Chief M.O. 1200 Rs. a month.

Birmingham, Ear and Throat Hospital.—Second H.S. At rate of £150.

Birmingham, Queen's Hospital.—Asst. Ophth. Surgeon. £50.

Birmingham, St. Chad's Hospital.—Res. M.O. £100.
Birmingham, Selly Oak Hospital.—Cas. O. At rate of £200.
Bootle Borough Hospital.—Hon. Radiologist.
Bristol General Hospital.—H.S. At rate of £80.
Bristol Royal Infirmary.—Hon. Asst. Surg. Also Hon. Anæsthetist.
Buxton, Devonshire Hospital.—Asst. H.P. At rate of £150.
Cambridge, Addenbrooke's Hospital.—H.S. At rate of £130. Also Res. Anæsthetist. Also H.P. At rate of £180 and £130 respectively.
Cambridge University, Pathological Laboratory.—John Lucas Walker Studentship. £300.
Canterbury, Kent and Canterbury Hospital.—Hon. Radiologist
Cottingham, E. Yorks, Tuberculosis Sanatorium.—Res. M.O. £185.
Derby, Derbyshire Royal Infirmary.—Two H.S.'s. Each at £150. Also Hon. Asst. Ophth. Surgeon.
Dreadnought Hospital, Greenwich, S.E.—Med. Supt. £300. Also H.P. and H.S. Each at rate of £110.
Dudley, Guest Hospital and Eye Infirmary.—Asst. H.S. £150.
East Ham Hospital, Shrewsbury-road, E.—Hon. P.'s and S.'s.
East Ham Memorial Hospital, Shrewsbury-road, E.—Res. M.O. and Res. H.P., and Cas. O. At rate of £150 and £100 respectively.
Exeter City Mental Hospital.—Asst. M.O. £350.
Guy's Hospital, S.E.—Asst. Physician.
Hampstead General and North-West London Hospital, Haverstock-Hill, N.W.—H.S. Also H.P. Each at rate of £100.
Hong-Kong University.—Chair of Medicine. £800.
Hospital for Epilepsy and Paralysis, Maida Vale, W.—Med. Reg. £100.
Hospital for Sick Children, Great Ormond-street, W.C.—Surgeon.
Hospital for Tropical Diseases, Endsleigh-gardens, W.C.—H.P. At rate of £135.
Indian Medical Service.—Recruitment of European Officers.
Jewish Health Organisation of Great Britain, 4, Upper Gloucester-place, N.W.—Medical Supervisor of Jewish Evening Schools. 30s. per visit.
Kensington, Fulham and Chelsea General Hospital, 194, Fin-borough-road, Earl's Court, S.W.—Res. M.O. At rate of £100.
Leeds Jewish Herzel-Moser Hospital.—Res. M.O. £50.
Leicestershire County Council.—Asst. Tub. M.O. £600.
Liverpool, Hahnemann Hospital, Hope-street.—Stipendiary M.O. At rate of £125. Res. M.O. At rate of £100. Also Clin. Asst.
London Jewish Hospital, Stepney Green, E.—Cas. O. At rate of £150.
London Lock Hospital, 91, Dean-street, W.—H.S. At rate of £200.
Luton Borough.—Asst. M.O.H., &c. £600.
Manchester, Ancoats Hospital.—Orthopædic Registrar. Also Med. Registrar. £100.
Manchester Babies Hospital.—Jun. Res. M.O. At rate of £50.
Manchester, Barnes Convalescent Hospital, Cheadle.—Res. M.O. £250.
Manchester, Salford Royal Hospital.—Res. Surg. O. £200. H.P.'s and H.S.'s, also Cas. H.S. Each at rate of £125.
Manchester Victoria Memorial Jewish Hospital, Cheetham.—Hon. Anæsthetist. £50.
Metropolitan Hospital, Kingsland-road, E.—Res. Cas. O. At rate of £100.
National Hospital, Queen-square, W.C.—H.P. £150.
Paddington Green Children's Hospital, W.—Surgeons.
Plymouth City Mental Hospital, Blackadon, near Ivybridge.—Jun. Asst. M.O. £300.
Poplar Hospital for Accidents, East India Dock-road, Poplar, E.—Jun. Res. O. £175.
Redruth, Cornwall, West Cornwall Miners' and Women's Hospital. Radiographer.
Royal Northern Hospital, Holloway, N.—Obstetric Physician.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—H.P. At rate of £100.
St. Helens, County Borough.—Deputy M.O.H. £700.
St. Mary's Hospital, W.—Med. Supt. £400. Also Medical Registrar. £200.
St. Mary's Hospital, Institute of Pathology and Research, W.—Research Studentship. At rate of £200.
St. Thomas's Hospital, S.E.—Res. Asst. Physician, also Medical Registrar.
Sheffield, Jessop Hospital for Women.—Three Asst. H.S.'s. Each at rate of £100.
Sheffield, Royal Infirmary.—Jun. Aural and Ophthalmic H.S. At rate of £80.
Shrewsbury, Royal Salop Infirmary.—Res. H.S. Also Res. H.P. Each at rate of £160.
Southampton, Parkd Infirmary, Shirley Warren.—Second Res. Asst. M.O. £275.
Tolworth Hospital.—Med. Supt. £250.
Truro, Royal Cornwall Infirmary.—H.S. £170.
University of London, South Kensington, S.W.—Godfrey Duveen Travelling Studentship in Oto-Rhino-Laryngology. £150.
Virginia Water, Surrey, Holloway Sanatorium.—Jun. Asst. M.O. £250.
West African Medical Staff.—M.O. £800.
Wolverhampton General Hospital.—Clin. Asst.
Worcester, Worcestershire County Council.—Asst. County M.O. £[illegible]

Notes, Comments, and Abstracts.

THE HEALTH OF THE UNDERGRADUATE.

THE "Essai sur l'hygiène universitaire,"[1] which Dr. Robert Jacquet, of the University of Nancy, has just published, fills a gap and fills it very ably. The author is described on the cover as the President of the French National Union of Students, and Mr. Herriot, who has supplied a preface, refers therein to his "youthful ardour," whilst there is internal evidence of ten years' work in the special field which he has chosen, so one is justified in concluding that he is exceptionally well placed to know his subject. He has, at all events, mapped out the field in masterly fashion and has not contented himself with pointing out deficiencies: in every case he suggests remedies. The book describes the situation of the university student in France and is therefore only partially applicable to residential universities in England, but so much of what is described does apply to our own universities that it should stimulate thought on both sides of the Channel.

Part I., entitled "The Future Student," describes the health conditions surrounding the French collegian before he enters a university—the overloaded curriculum, the lack of physical exercise, the poor teaching of hygiene, the total exclusion of sex hygiene. The remedies suggested are obligatory medical examination, classification according to physical ability, proper times for physical exercises and sports, and systematic teaching of hygiene including lessons in sex hygiene by a doctor. Dr. Jacquet puts in a special plea for vocational guidance, and he considers that the right time for the tests and vocational examination to take place is at the age of 16 to 18, when the boy (girls are not mentioned in this book) leaves his college or lycée before entering the university.

Part II. describes the conditions surrounding the undergraduate on arrival at the university. Often he lodges in poor furnished rooms in the oldest quarter of the town (the author remarks on the similarity between a map of Nancy showing the worst centres of tuberculosis and one showing the quarters where most students' lodgings are advertised). Fortunately students' hostels are now springing up. In Paris the fine *Cité universitaire*, international in conception, is already inhabited in part; and at Nancy the university is putting up a similar residential hostel for its students in a park on the outskirts of the town. Poorly housed as the undergraduate is, he is often worse fed. Here the suggested remedy is to have coöperative restaurants, one of which is already working in Paris. Having fed and housed the student, the next thing is to provide him with exercise. The chapter devoted to the need for sports in universities might be skipped by the English reader, were it not that the author has inserted a warning against what he calls "athletic exhibitionism." The term is eloquent.

Health teaching in the university should continue and supplement that given at school, and should include lectures on public health and industrial hygiene. To the objection that undergraduates will not attend such lectures, Dr. Jacquet replies that the Students' Union at Nancy organised a series of them with the greatest success and that the halls were crowded. Medical students, he adds, should be obliged to attend lectures on public health; the need for such insistence is in itself astounding.

The first three chapters of Part III. describe the Swiss University Sanatorium at Leysin, the projected international university sanatorium, also at Leysin, and the sanatorium in the French Alps belonging to the French National Union of Students. Plans and illustrations add interest to the text. One can only hope that the international sanatorium will cease soon to be a plan and become a reality. English students are admitted to the Swiss sanatorium as far as numbers permit; the international sanatorium is to have 200 beds. Hardly less interesting is the author's description of a university health centre and dispensary, as he conceives it and as he hopes to have one erected in the University of Nancy. The plans, which have been approved, are published in this book. With this very concrete suggestion the author ends his vigorous essay. The reader will agree with Mr. Herriot when he says: "What is the good of training minds, of raising them to the highest scientific levels, if bodily weakness renders these young people's efforts sterile, so that all the sacrifices made by the family and community for their education are made in vain?"

OSLER AS EPIDEMIOLOGIST.

In amplification of his remarks made at the meeting of the Osler Club last July, to which we alluded in a previous issue,[2] Dr. J. D. Rolleston in a recent paper[3] emphasises the keen interest taken by Sir William Osler in the study of epidemic diseases, an interest doubtless inspired to

[1] N. Maloine, Paris. Pp. 189. Fr.15.
[2] THE LANCET, July 21st, 1928, p. 141. [3] Clin. Journ., Nov. 28th.

some extent by the fascinating history connected with many of them. His familiarity with the work of the earlier epidemiologists is illustrated in his text-book and miscellaneous writings, particularly his essay on "Some Aspects of American Bibliography." Although small-pox, cerebro-spinal fever, and venereal disease formed the subject of some of his more important addresses, typhoid fever and tuberculosis were the infectious diseases to which he devoted most of his attention. The importance which he attributed to typhoid fever, which owing to the heavy toll it levied among young persons, he called "the minotaur of infectious diseases," is shown not only by its occupying the first place in his text-book, but also by his dictum that a student could learn most of medicine and a good deal of surgery—the latter mostly at the patient's expense—by the study of this disease alone. The insanitary conditions responsible for the outbreaks of typhoid fever which was rife in America, particularly at Baltimore, when Osler was professor of medicine at Harvard, frequently provoked a protest from him. The incidence of typhoid fever, he maintained, was the sanitary index of the community, and in the matter of purification of their large towns he accused the United States of being a generation behind Europe. Many years later, shortly after the outbreak of the war, he urged the necessity of antityphoid inoculation, and denounced the "sons of Belial" who were trying to oppose the measure. In like manner his conviction of the value of vaccination against small-pox is illustrated in a characteristic passage in his essay entitled "Man's Redemption of Man," in which he issues a "Mount Carmel-like challenge to any ten unvaccinated priests of Baal." Osler's interest in tuberculosis assumed a very practical form. In 1902 he was responsible for the establishment of the first tuberculosis dispensary at Baltimore. He also took an active part in the campaign against tuberculosis in Philadelphia and in England, where he helped to form the National Association for Prevention of Consumption in 1903, and started an Oxford branch of the Association in 1910, while it was only his fatal illness which prevented him delivering an address before the Association in 1919. His interest in epidemic disease was maintained until the end. In June, 1918, he paid a special visit to the London Hospital to see the first cases of lethargic encephalitis, and a few months before his death he approached the Foreign Office for concerted medical action to deal with the deplorable sanitary conditions in Vienna which were a menace not only to German Austria but also to the rest of Europe.

HOSPITAL CONTRIBUTORY SCHEMES.

A SUGGESTION FOR A COMBINED APPEAL.

IN the course of an instructive address on the Future of the Voluntary Hospitals to a meeting of hospital officers held at Liverpool on Nov. 23rd, Captain J. E. Stone, F.S.A.A., remarked on the excellent field offered by contributory schemes for the purpose of raising additional revenue. They have, he said, become recognised as a bountiful source of income, and they have the merit of increasing the interest of the public in the work of the hospitals. Schemes of one sort or another are now very numerous all over the country; generally the basis is the same, a weekly contribution, but beyond this there is little or no uniformity. It now appears that the time is opportune for the consideration of some universal contributory scheme with distribution on the basis of the work done for members. The scheme would be available to the community as a whole, a sort of insurance scheme whereby weekly or other payments in time of health would ensure hospital treatment in times of sickness. Under a coördinated scheme the voluntary hospitals would themselves be coördinated and a contributory scheme carried on under the guidance and direction of an advisory body of voluntary hospitals would seem to possess attractions and open up the possibilities of a considerable increase in revenue.

Generally appeals are not, Captain Stone remarked, so successful to-day as they were a few years ago. Ballots, "stunts" of various kinds, emotional propaganda, "S.O.S." messages, flag days, and all the hundred and one other methods used by the voluntary hospitals have had their day. They still bring in some revenue, but it is a question whether they have not done more harm than good in other directions. There is growing up a feeling of hard-heartedness—the public is sick and tired of being told that one hospital is falling down, that another cannot pay its meat bill, and that another is closing beds. It is growing acclimatised to even the most heartrending appeal. Every person whose name appears in a directory is deluged with charitable appeals from hospitals not only in his own interest but from larger ones in the surrounding area, and from others, too, hundreds of miles away.

A combined appeal on a national basis, run by county associations, would be better, in Captain Stone's opinion, than all these smaller efforts. A soundly conceived contributory scheme for the whole country offers in fact the best solution of the financial problem as far as the voluntary hospital is concerned.

THE KING'S ILLNESS.

OFFICIAL BULLETINS.

(*Continued from p. 1166.*)

THE following is the text of the official bulletins which have been issued during the King's illness by Sir Stanley Hewett and Lord Dawson.

THURSDAY, NOV. 29TH. 10.15 A.M.

The King has passed a quiet though rather sleepless night. The infective process is being held in check.

7.30 P.M. The King has had a quiet day with some sleep. Otherwise conditions remain unchanged.

FRIDAY, NOV. 30TH. 12.20 P.M. (This bulletin is signed also by Sir Humphry Rolleston.)

The inflammation of the lung and pleura shows some improvement and the temperature is on a slightly lower level. It must be noted that the time of possible exacerbation of the infection has not yet passed, and in any case progress must be slow.

8.15 P.M. The condition of His Majesty the King shows no change this evening.

SATURDAY, DEC. 1ST. 10.30 A.M.

In spite of His Majesty having passed a fair night, there has been a slight rise in the temperature since yesterday. The general condition remains unchanged.

8.30 P.M. The King has had rather a disturbed day, with short intervals of sleep, and is therefore somewhat fatigued.

SUNDAY, DEC. 2ND. 11.15 A.M.

The King has had rather a restless night. This morning the temperature is lower, and the infective process shows some improvement. The general strength, though at present adequate, is at this stage of the illness being taxed.

8.20 P.M. His Majesty has had a quieter sleep during the day. The infective process has continued to diminish and the temperature to-night is 100°. At the same time there is a decline in the strength of the heart which causes anxiety.

MONDAY, DEC. 3RD. 12.10 A.M. (Signed also by Sir Farquhar Buzzard and Dr. L. E. H. Whitby.)

His Majesty the King has had some sleep during the last three hours. A further consultation confirms the opinion expressed in the last bulletin, and, in spite of the improvement in the lung, anxiety concerning the strength of the heart persists.

10.30 A.M. The King has had three hours of quieter sleep since the issuing of the last bulletin. The temperature is now 99·8° and there is slight improvement in the general condition.

MONDAY, DEC. 3RD. 8.15 P.M. (Signed also by Sir Farquhar Buzzard and Sir Humphry Rolleston.)

The slight improvement in His Majesty's condition noted this morning has been maintained. The temperature is nearer normal, but it is necessary to emphasise that the anxiety concerning the heart still persists.

TUESDAY, DEC. 4TH. 10.30 A.M.

The King has passed a quieter night. Though the anxiety concerning the heart must continue, the improvement noticed last evening is so far satisfactorily maintained.

3.30 P.M. His Majesty the King passed a quiet morning. Though the temperature is now 100·2° the slight improvement in the general condition noted in the last bulletin is maintained. (Signed also by Sir Farquhar Buzzard, Sir Humphry Rolleston, and Dr. Whitby.)

8.30 P.M. The rise of temperature noted in this afternoon's report persists and as a result the King is rather less comfortable. Otherwise conditions remain unchanged.

WEDNESDAY, DEC. 5TH. 10.30 A.M.

The King has passed a fair night. There are reasons to hope that the recrudescence of the infection which caused the last rise of temperature is being moderated.

8.15 P.M. Though the King has had a quiet day, the temperature has risen to a point higher than at the same hour last evening, showing that the recrudescence of the infection is still active. The strength is maintained. (Signed also by Sir Farquhar Buzzard and Sir Humphry Rolleston.)

Oliver-Sharpey Lectures

ON AN EXPERIMENTAL STUDY OF CERTAIN VISCERAL SENSATIONS.

Delivered before the Royal College of Physicians of London

BY E. P. POULTON, D.M. OXF.,
FELLOW OF THE COLLEGE AND PHYSICIAN TO GUY'S HOSPITAL.

LECTURE I.*

Delivered on May 1st, 1928.

BEFORE beginning my lectures I should like to acknowledge how much help I have received from others in their preparation. By far the greater part of the work has been joint work, and I should like specially to thank Dr. W. W. Payne, formerly Parsons Research Fellow at Guy's Hospital, for his willing and conscientious coöperation in the greater part of it.

HISTORICAL.

The subject of visceral sensation is a wide one, and has been investigated from many points of view. Thus, if pain is taken for consideration, as it is the sensation that has been dealt with most frequently, there is the problem as to whether it is felt in the organ itself, and whether it is at the same time referred to the external coverings of the body as was originally suggested by Ross.[1] There is the detailed work of Head[2] on the relation of these referred areas of pain to the underlying viscera by means of nervous connexions running through the spinal cord; there is the closely related work of Mackenzie[3] and his view that *all* visceral pain is felt superficially in the skin, voluntary muscles, and loose underlying connective tissue of the body wall. These problems have been considered time and again by different authors, and the general conclusion come to was that Ross was correct in his original presentation of the subject.

Then, again, there is the problem of the uninsulated character of the pain nerve-endings, as described by Trotter[4]; there are the problems concerned with afferent paths of sensation, such as McDowall[5] has touched upon for visceral sensation, and Adrian[6] also has dealt with as regards common and visual sensation. In this connexion it is right to emphasise how obscure at present are the problems concerned with visceral sensation. At least it is admitted as regards other sensations that light waves, sound waves, chemical agencies, mechanical strain with deformation of end-organs, are adequate stimuli for sight, hearing, taste, touch, pressure, and muscle sense. But as far as visceral sensation is concerned, there is no general agreement even as to the nature of the stimulus itself. It is to this latter problem that these lectures will be primarily devoted.

Looking backwards it is easy to see that if again pain is taken as the subject of inquiry, two main theories have been advanced as to its nature. Magendie,[7] one of the classical investigators, described the severe pain which accompanies the swallowing of a large bolus as being produced by the distension of the nerve-fibres of the pectoral part of the œsophagus. While Haller[8] had observed that the bile-duct and ureter were *insensitive* to mechanical stimuli of various kinds, though they produce very intense sensations during the passage of gall-stones or renal calculi, Sherrington[9] has pointed out that the stimuli to produce sensation in viscera must be *adequate*, or, to be precise, mechanical stimuli to produce pain are distensile. This is the point of view taken up by Hurst[10] in his well-known Goulstonian Lectures, and he has gone further in suggesting that all types of visceral sensations, except hunger, are of the same nature, and are produced by tension of different degrees on nerve-endings in the muscles.

A second theory of visceral sensation was originated by Cannon and Washburn[11] in their well-known paper on hunger. Defining hunger as a dull ache or gnawing sensation referred to the lower mid-chest region and the epigastrium, they found that the pangs were associated with those gastric (and œsophageal) contractions that Boldireff had previously described. However, they state that almost invariably the contraction reached its maximum position before the record of the sensation was started, drawing the conclusion that the contraction caused the sensation, and that it was not the hunger that caused the contraction. Carlson and his co-workers[13] have greatly amplified these observations. Again, Mackenzie[14] has argued that vigorous peristalsis is the cause of visceral pain, and there is a well-known clinical observation of his on a patient on whom he was operating when pain was produced every time a peristaltic contraction of the bowel converted it into a thick fleshy rod.

Hurst,[15] while stating that peristalsis is not itself a cause of pain, has combined both these theories by suggesting that in both stomach and intestine and other hollow viscera a downward wave of peristalsis produces a ballooning of the viscus just below against some point of resistance such as the spasm or achalasia of a sphincter or a foreign body. He believes that the ballooning is responsible for the pain, since the nerve-fibres in the muscle are stretched. Cannon's graphic description[16] suggests that pain of this kind may perhaps occur in intestinal obstruction. He says:—

> "The moving constrictions were evidently powerful, for as they advanced the walls of the canal in front were bulged widely by the compressed contents; and when the peristaltic ring could no longer withstand the pressure it was causing, the contents squirted back through the advancing ring for some distance along the gut."

But evidence will be given that the commonly occurring gastric pain is certainly not due to movements of this nature.

POSTURE AND TONE.

Sherrington[17] has applied his conception of posture to the viscera. The size or volume of viscera may vary without necessarily causing much alteration of the internal pressure. His illustrations were taken chiefly from Mosso and Pellacani's work on the bladder and Cannon's work on the stomach. Increase in posture is brought about either by the lengthening of the muscle-fibres in the wall or by the sliding of muscular sheets over one another, so that the thickness of the wall is lessened and the capacity is increased; but while posture is a function easily defined, let us beware in this connexion of the expression "postural tone," since I shall hope to show that tonus or tone is another different property of smooth muscle as readily defined and equally important. In order to obtain a graphic record of the pressure in the œsophagus Payne and I[18] introduced into the latter a toy balloon which was tied onto the end of a long œsophageal rubber catheter. The other end of the catheter was connected with (1) a funnel and water reservoir so that the volume of air in the balloon could be varied; and (2) a water manometer, the other end of which was connected to a Brodie's bellows, so that the excursions of the manometer could be recorded on a kymograph. In recent experiments by Ride and myself the Brodie's bellows has been replaced by a very small form of recording spirometer, made on the principle devised by Krogh.† The experiments were carried out in the lower part of the œsophagus where the muscle is *unstriped* and the volume of air used was never more than the capacity of the bag—i.e., 50 c.cm. or 200 c.cm., as the case might be. This means that outside the *body* the bag could accommodate the amount of air used in the experiments without any increase of its internal pressure while its walls remained flaccid. Inside the œsophagus the bag acted as a stretching force, because, owing to the smaller size of the œsophagus, the bag could not

* The introductory remarks on the foundation of the lectures have been omitted. Lecture II., with all the references, will appear in next issue.

† This apparatus is supplied by C. F. Palmer, Ltd., Prixton, London.

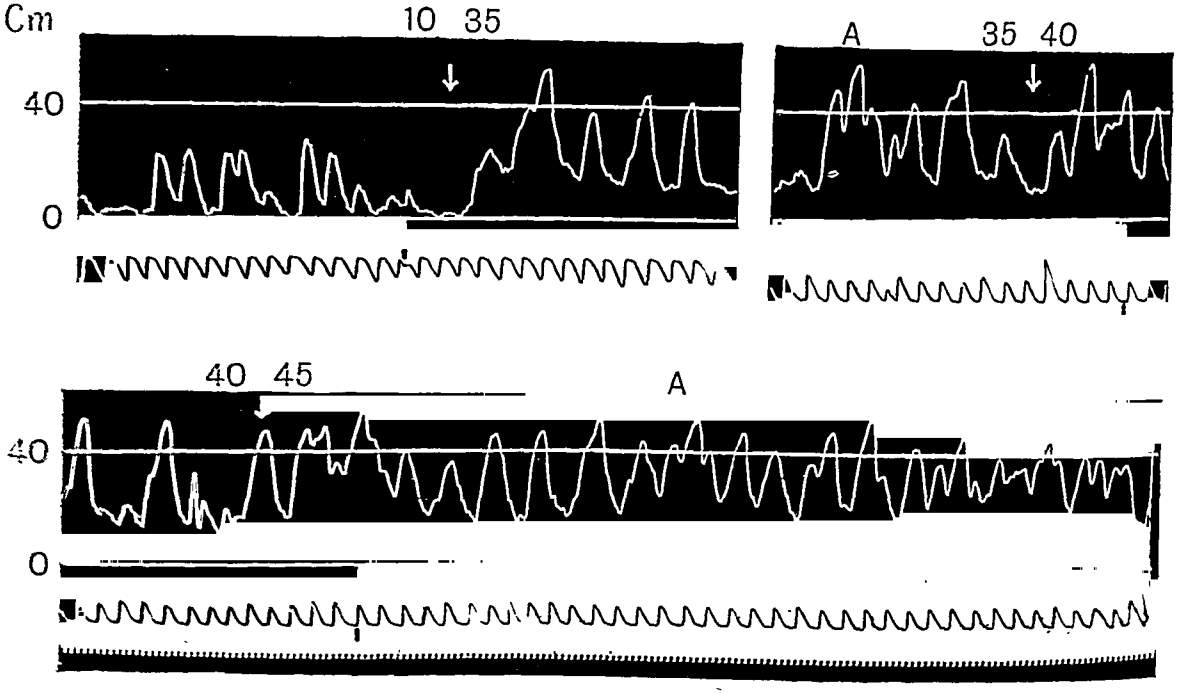
accommodate the amount of air introduced and yet preserve its original spherical shape. It became fusiform.

The advantage of our procedure is that the pressure reached in the bag represents the pressure actually being exercised by the œsophageal muscle. Fig. 1 shows the pressure in centimetres of water recorded in the œsophagus by a rubber bag of 50 c.cm. capacity, when the contents of that bag was increased (at the arrows) from 10 c.cm. up to 45 c.cm. The most striking appearance is the regular succession of peristaltic waves lasting from about 3 to 8 sec. each. These waves may be said to start from a base line which itself slowly varies and they reach a level of over 40 cm. This level tends to remain constant larger. In the case of a cylinder the relation between tension T and pressure p and radius r is given by the equation $T = pr$, so that when the pressure remains the same the tension increases with the radius. It is surely a mistake to identify high tone with low tension; but that is what the doctrine of the "tonus ring" has done.

A Theory of Visceral Pain.

The theory of visceral pain which has been put forward as the result of our experiments is that pain is due to the stretching with consequent deformity of the nerve-endings subserving the sense of pain, which are situated in the walls of the viscus. When the volume of air in the bag at the lower end of the

Fig. 1.



The lower tracing is respiration, inspiration being shown by an upstroke on the respiratory tracing, and a downstroke on the œsophageal tracing. Time in seconds. Simultaneous points are shown by small white strokes. The other figures are arranged similarly.

even though the air in the bag is increased and the base line is rising all the time. A. R. Thompson[19] has obtained similar curves from the bladder. The term systolic pressure may quite well be applied to the tops of these peristaltic waves on the a[illegible] of the heart and the term diastolic pressure [illegible] base line. (This is a wider use of these term[illegible] that suggested recently by Alvarez.[20]) As [illegible] visceral sensation is concerned, it is the dia[illegible] pressure that is important, or more correctly [illegible] tension of the muscle during diastole. It is [illegible] value that may be defined as the tone of plain mu[illegible] Fig. 1 shows that as the tone rises the perist[illegible] pressure waves are at first increased; but then t[illegible] get less, and, finally, they [illegible] away complet[illegible] as the tone reaches a maxi[illegible]

Unfortunately the term [illegible] applied t[illegible] other conditions for which i[illegible] le, and much [illegible] confusion has arisen. Canno[illegible] observed [illegible] that in various places the [illegible] ent a [illegible] sustained contraction with l[illegible] ircum- [illegible] ference and waves of contrac[illegible] this [illegible] point and passed in successio[illegible] dilated parts. He called the [illegible] contraction a tonus ring, although [illegible] tension of the muscle at the tonu[illegible] than it was elsewhere where the ci[illegible]

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trying to drive the bag downwards. In spite of s the tension on the pain-endings falls because diameter of the viscus diminishes. In other rds, the scle by con- cting takes e tension m off the vous struc- es. If the ristaltic ve succeeds removing e foreign dy the pain ll disappear tirely: but the bag is ed in posi- on by an tachment tside the outh the ve must be effective, and it passes by e diameter of e bag will come large ain and pain come re- tablished. It llows that in may be lt during e *relaxation* of a peristaltic contraction. Fig. 2 ovides a proof of this thesis. Two bags were aced in the œsophagus, one just above the her: the upper bag (upper tracing) contained c.cm. of air, the lower bag was empty. At the nall white mark 40 c.cm. as suddenly introduced to the lower bag. A series peristaltic waves passed own causing a rise of essure in each bag in rn. The introduction of r caused a slight con- nuous pain, which showed cacerbations at regular tervals indicated by escent of lever. It was bserved that the exacerba- ons of pain came on sud- enly: but the sensation nded off somewhat indefi- itely. It is clear that the cacerbation was first oticed during the relaxa- on after a peristaltic con- raction, while the contrac- on itself definitely dimi- ished the sensation. These eristaltic contractions were uite unnoticed by the atient. They were not onnected with swallowing r any movement of the hroat. Consequently they ere an example of what Meltzer[11] has described as econdary peristalsis. In iew of the truly surprising ature of this and other imilar results we thought t advisable to try to get adiographic evidence of the ppearance of the œsophagus during experimental om. An air bag was made out of two rubber balloons f the same size by squeezing one inside the other. The space between the two was filled with a sus- ension of bismuth, and the necks tied one over the other on to a catheter. On filling the inner balloon with air the bismuth was spread over its surface, and an air bag was obtained with its walls opaque to X rays. Two catheters with opaque walled air bags were passed into the œsophagus one above the other. Outside the body they were connected with an apparatus for filling them with different volumes of air. When each contained 10 c.cm. the patient experienced a small amount of continuous pain. Fig. 3 (A) is an outline of the bags in situ. The walls were well defined, so that during the two or three seconds' exposure the œsophagus had remained fairly quiet. The lower bag was then filled with 30 c.cm. of air (B), which dilated but did not lengthen it, while the upper bag was practically unchanged. Pain of medium intensity was experienced. After another experiment, which need not be described here, 40 c.cm. air was introduced into the lower bag, while the upper bag still contained 10 c.cm. (D). Pain of maximum intensity was felt about one second before the exposure of the plate began: it then steadily diminished, and was nearly but not quite minimal by the end of the exposure. In the plate it was almost impossible to see the lower bag at all except for the dark shadow of the bismuth at its lower end which lay beneath the dome of the right diaphragm. Measurement shows that the lower bag was increased in length by 1 cm. and the upper bag by 9 mm. The indistinctness of the outline indicated that movement was actually occurring during exposure, and since these movements resulted in elongation of the bags they were clearly due to the passage of a peristaltic wave which successfully squeezed the foreign body and so caused a diminution in the pain produced by it.

FIG. 2.

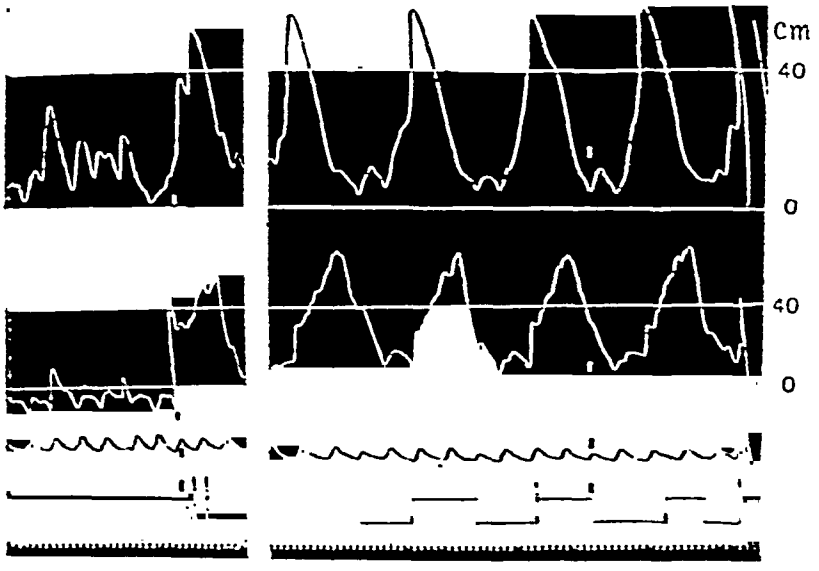
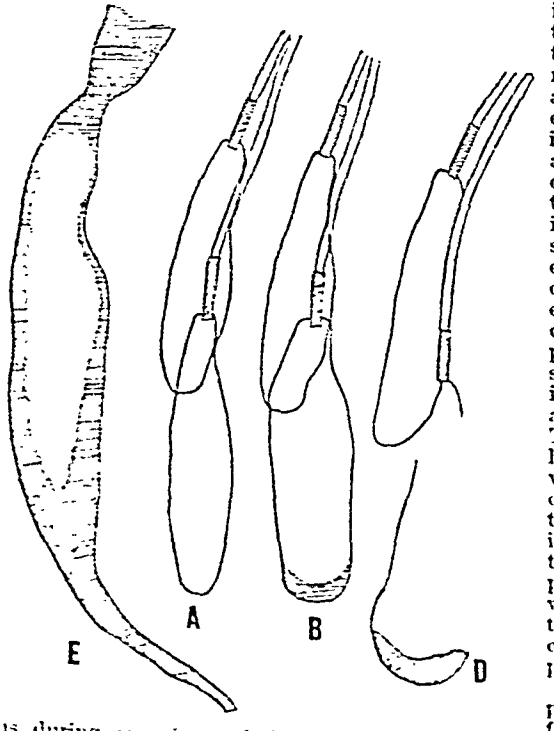


FIG. 3.



(3) Stretching of the œsophageal wall was an obvious factor in causing pain in Fig. 3 (B): but there is in such experiments a third mechanism to be considered which must help to increase the intensity of the pain: it is due to the *holding up of the peristalsis*.

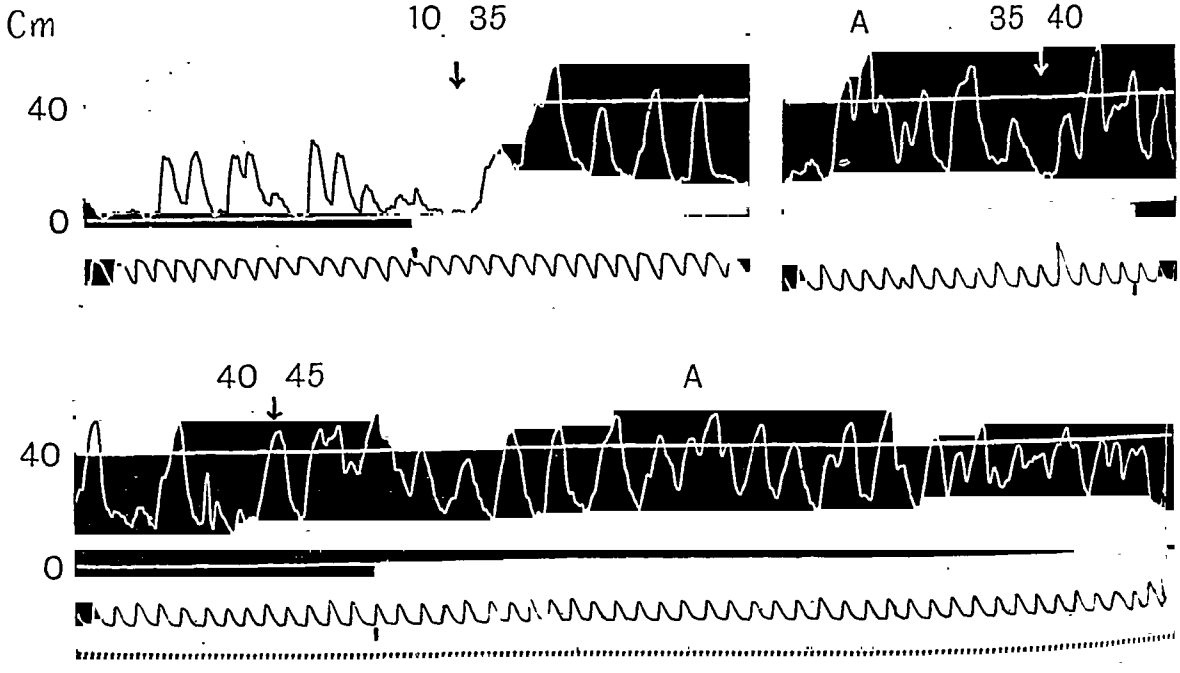
This was investigated by means of a rubber bag

accommodate the amount of air introduced and yet preserve its original spherical shape. It became fusiform.

The advantage of our procedure is that the pressure reached in the bag represents the pressure actually being exercised by the œsophageal muscle. Fig. 1 shows the pressure in centimetres of water recorded in the œsophagus by a rubber bag of 50 c.cm. capacity, when the contents of that bag was increased (at the arrows) from 10 c.cm. up to 45 c.cm. The most striking appearance is the regular succession of peristaltic waves lasting from about 3 to 8 sec. each. These waves may be said to start from a base line which itself slowly varies and they reach a level of over 40 cm. This level tends to remain constant even though the air in the bag is increased and the base line is rising all the time. A. R. Thompson[19] has obtained similar curves from the bladder. The term systolic pressure may quite well be applied to the tops of these peristaltic waves on the analogy of the heart and the term diastolic pressure to the base line. (This is a wider use of these terms than that suggested recently by Alvarez.[20]) As far as visceral sensation is concerned, it is the diastolic pressure that is important, or more correctly the tension of the muscle during diastole. It is this value that may be defined as the tone of plain muscle. Fig. 1 shows that as the tone rises the peristaltic pressure waves are at first increased; but then they get less, and, finally, they may die away completely as the tone reaches a maximum value.

Unfortunately the term tone has been applied to other conditions for which it is unsuitable, and much confusion has arisen. Cannon,[16] for instance, observed that in various places the intestine underwent a sustained contraction with lessening of the circumference and waves of contraction originated at this point and passed in succession over neighbouring dilated parts. He called the point of sustained contraction a tonus ring, although he realised that the tension of the muscle at the tonus ring was lower than it was elsewhere, where the circumference was larger. In the case of a cylinder the relation between tension T and pressure p and radius r is given by the equation $T = pr$, so that when the pressure remains the same the tension increases with the radius. It is surely a mistake to identify high tone with low tension; but that is what the doctrine of the "tonus ring" has done.

FIG. 1.



The lower tracing is respiration, inspiration being shown by an upstroke on the respiratory tracing, and a downstroke on the œsophageal tracing. Time in seconds. Simultaneous points are shown by small white strokes. The other figures are arranged similarly.

A THEORY OF VISCERAL PAIN.

The theory of visceral pain which has been put forward as the result of our experiments is that pain is due to the stretching with consequent deformity of the nerve-endings subserving the sense of pain, which are situated in the walls of the viscus. When the volume of air in the bag at the lower end of the œsophagus is increased by stages the diastolic pressure and consequently the tone rises, and at a certain point pain is felt. Thus in the case of W. W. P., with 10 c.cm. in the bag the pressure was −5 cm.; with 30 c.cm. it was 11–15 cm.; with 40 c.cm. it was 17–21 cm., and pain was felt continuously.

Given a state of pain due to this cause there are two ways in which the viscus may react so as to diminish the sensation, and there is a third mechanism which will increase the pain.

(1) *The posture may be increased*, so that the bag is now more readily accommodated inside it, and ceases to act as a stretching force, and the pressure inside it falls. For instance, in Fig. 1B with 45 c.cm. in the bag the diastolic pressure varied from 14–26 cm., and there was no pain recorded at all; but three days later, when the bag was filled at the beginning with 40 c.cm., the diastolic pressure was never below 24 cm., but was often over 30 cm., and pain was felt most of the time. In Fig. 1 the contents of the bag had been increased gradually, and the œsophagus had had time to adapt itself by increasing its posture.

(2) *The muscle may undergo a systolic contraction.* Of course, this materially increases the pressure in the bag, and the tension of the muscle will also be greatly increased because the muscle is doing work

at which the pain due to a distending bag as in Fig. 5 should become lessened: (1) during the short, sharp relaxations of the muscle above the bag, when the zonal strain would be relieved; and (2) at the peaks on the lower tracing, when there would be some shortening of the stretched œsophageal wall by means of active muscular contraction.

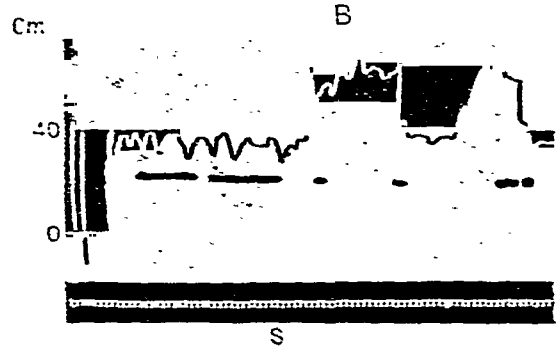
Similarly, there are two points in the cycle at which the intensity of the pain would become increased: (1) at the beginning of systole, when the œsophagus has contracted above the distending bag, but has not yet succeeded in compressing it, so that zonal strain is established; (2) at the end of systole, when the active contraction has passed off and the condition of stretch becomes re-established.

Both Payne and myself took part in these experiments, but there was this difference between us—viz., that on the whole it was much easier with the apparatus used to produce severe pain in him than in myself. Further, W. W. P. is inclined to suffer from indigestion, which is not the case with myself. Radiograms of the lower part of the œsophagus immediately after swallowing a mouthful of barium emulsion showed that my œsophagus was the wider of the two, the maximum diameter for E. P. P. being 2·4 cm. and for W. W. P. 2 cm. With a given volume of air in the bag a bigger excitation might be expected in the latter case. On comparing the pressure curves from the two subjects there was a striking difference, since in the case of W. W. P. single large contractions were often recorded when the tonus remained rather low (see Fig. 2), while in the case of E. P. P. the tonus was increased and the contractions were often multiple, and not very large (Fig. 1). The maximum systolic pressures were about the same in both cases.

When the pain produced by an air bag was of short duration it was recorded during the relaxation stage of a peristalsis, and when the pain was of longer duration it began during relaxation (Fig. 2), which suggests that tension is most likely to be exerted on the pain-endings when the fall of pressure is large and rapid. We have suggested that high tonus is itself responsible for pain; but the steady state of tension which fix posture, which have been described by Sherrington and Bayliss.

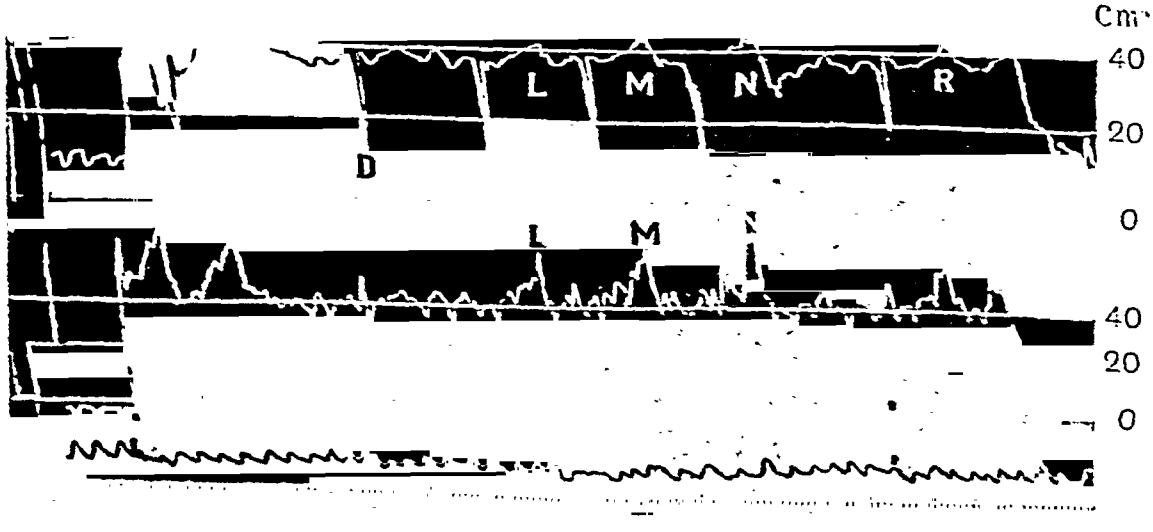
The character of the pain produced in our experiments varied according as it was continuous or intermittent. In the former case it had a burning character, and was reminiscent of heartburn. An unpleasant sensation referred to the throat, but also situated deeply at about the level of the suprasternal

FIG. 6.



notch, was present if the bag was high up in the œsophagus. If it was lower down the pain was usually referred to the costal angle and the lower part of the sternum in the mid-line. When the pain was intermittent it had what was best described as a gripping or griping character, and the relation of the two types of pain was well seen in an experiment on W. W. P. on May 25th (Fig. 6). At first with 45 c.cm. in the bag continuous severe burning pain was noticed. The diastolic pressure was 30 cm., and there were only respiratory variations. A swallow was then taken (s) and this was followed by a series of peristaltic contractions, each of which caused diminution in the pain and converted it from a burning pain into a gripping pain. Later on the contractions stopped, and the pain again became continuous and burning

FIG. 5.

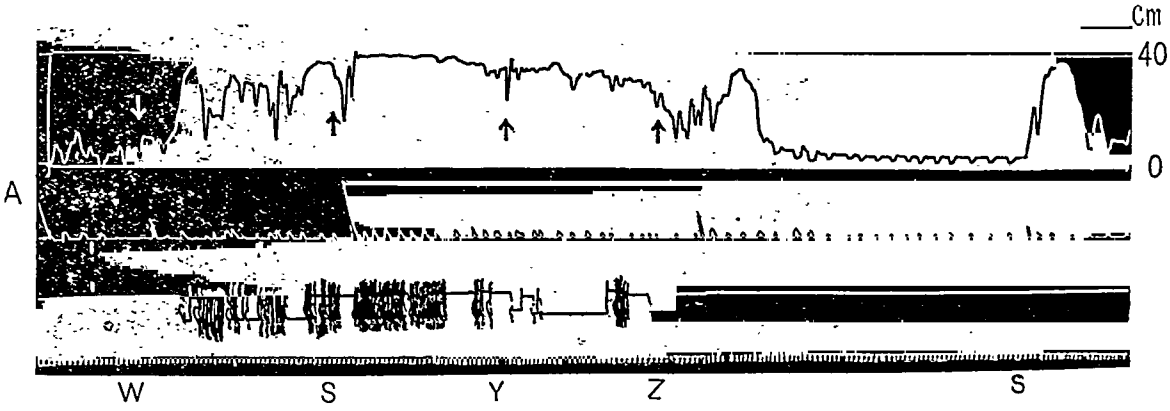


due to this cause may not be so painful as the rapid increase of tension that occurs during the relaxation when the muscle is ceasing to bear the greater part of the strain. Hence a condition of high tonus may be of actual advantage in that it checks the relaxation in its commencement and from this point of view it is tempting perhaps to try to draw some analogy between the tonus of plain muscle as we have defined it and the check or catch functions of certain plain muscles

We noticed the same thing on another occasion, when after a period of severe continuous burning pain without contractions a little air was let out of the bag. Large peristaltic contractions then appeared which made the pain intermittent, and so gave it a gripping character. A recent observation by L. T. Ride and myself suggests that the burning element of the pain may be due to simultaneous superficial vaso-dilatation.

about the size of a large finger-stall which was placed inside an inextensible linen case and then tied on to a stiff catheter. This was placed inside the lower part of the œsophagus and arrangements were made so that water could be forced into the bag under such a high pressure as to prevent any possible squeezing of it by the œsophageal muscle. An ordinary toy balloon containing 10 c.cm. air and attached to a manometer and recording apparatus was also swallowed, so that the behaviour of the œsophagus above or below the part stretched could be investigated. Fig. 4 gives a tracing from the toy balloon when it was situated just above the incompressible bag. At W 17 c.cm. of water were suddenly forced in and a series of contractions began and pain was felt at once; it was continuous although it varied in intensity. It was worse during the contraction and was so bad that it was impossible for the subject (W. W. P.) to keep the lever down all the time. He found it easier to move it up and down so that the rapidity of the movement indicated the extent of the pain. At a point marked S he swallowed experimentally and pain became still worse, so that eventually a little water, about 5 c.cm., had to be let out. This is marked by the depression at Y. The effect of the swallow was to cause a sustained contraction of 27 seconds' duration at a pressure of 40 cm. It might almost be called a tetanus. There was a peristaltic wave after the water was finally let out at Z, and then the œsophagus became quite quiet, showing only respiratory movements and a swallow (S) taken at the end of the experiment was unaccompanied by any painful sensation.

FIG. 4.



In the next experiment the toy balloon was placed below the incompressible bag. On forcing in the water continuous pain was noticed; but it was not as bad as last time because the bag was probably not filled up so tightly. The only effect on the lower bag was a slight increase in diastolic pressure; but none of the peristaltic waves that were demonstrated in the previous experiment succeeded in getting past the incompressible bag, so as to be registered below. Respiratory movements were registered satisfactorily below, so that there can have been no squeezing of the connecting tube where it passed by the incompressible bag. As soon as the water was let out the pain stopped and two peristaltic contractions were now recorded without any painful sensation.

The theory that I have put forward is that visceral pain is due to stretching, but Fig. 4 shows that this theory alone is incomplete because, owing to the incompressibility of the bag, the amount of stretch produced by it must have remained constant from the time the water was put in until a small amount was let out; and yet the pain varied, becoming worse when a peristaltic wave was recorded immediately above the bag responsible for the pain. No doubt during peristalsis the top of the incompressible bag was being squeezed hard by the œsophageal muscle without any shortening of its fibres. An isometric contraction was taking place. At first sight this in itself might be considered enough to cause the pain, and so far there is no absolute proof that this was not the case; but on general principles it is extremely unlikely. For instance, to take an example from skeletal muscle, a tug-of-war is not an essentially painful form of exercise. In the case of the uterine plain muscle the intermittent contractions that occur throughout pregnancy are not painful. Every beat of the heart is associated with an isometric contraction of the ventricular muscle up to the time when the sigmoid valves are opened and blood becomes discharged. Hence it is necessary to look for another explanation of the increase of pain during contraction in Fig. 4. This is provided by another experiment in which two air bags were used (Fig. 5). The upper one contained 5 c.cm. and into the lower one 70 c.cm. air (the full capacity of the bag) were suddenly introduced. Pain of moderate severity was experienced immediately. Minor variations in pain were felt; but not recorded. An involuntary swallow was taken immediately the lower bag was filled and the pressure in both bags at once rose. L, M, N, R are simultaneous points on the tracing and represent the apices of peristaltic waves. The large depressions in the upper tracing are evidently due to the temporary relaxing or inhibition of the muscle that always precedes peristalsis—very obvious in this case because all the rest of the time the muscle was held in a state of sustained contraction similar to that shown in Fig. 4. The pressure exerted by the œsophageal wall was permanently increased at the site of both bags; but the diastolic pressure was much lower at the higher bag and its value is indicated by the pressure registered during the short inhibitory periods—under 20 cm. Except for these short inhibitions the muscle at the upper bag remained all the time in systole at about 40 cm. pressure. However, at the site of the lower bag which acted as the foreign body causing the disturbance, the muscle was being stretched and the peristaltic wave did not succeed in making any impression on the bag except for short periods of time in the middle of systole, so that except at the peaks L, M, N, R the pressure remained during systole at the diastolic value (about 40 cm.). When such an opposite state of affairs is taking place in two contiguous parts of the same organ it is not difficult to see that during systole a state of strain may be set up on the pain-endings in the zone between the muscle contracted down above and the muscle dilated and stretched just below. It is to this strain that the term painful spasm may be applied when a renal calculus or a gall-stone is held up in its progress along the duct, and no doubt this factor is also present in the violent peristalsis of intestinal obstruction described by Cannon, though possibly Hurst's hypothesis of the muscular wave itself producing distension below has an application in this special case.

Summarising, it may be pointed out that on our theory there are two points in the cycle of peristalsis

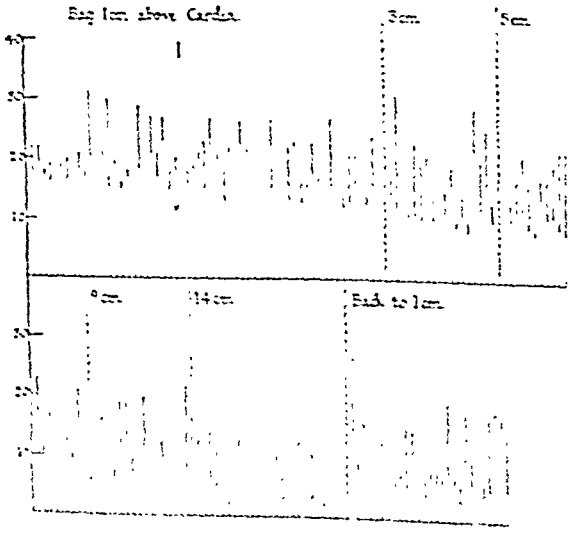
meal the pressure was lower, while the record remained flat and the patient was quite comfortable with no sensations.

We carried out further observations on this patient to find out the relation between the contractions of the stomach and the duodenum by means of two bags each attached to a manometer, while the excursions of both manometers were recorded on a kymograph. It was found that the systolic rises of pressure in the stomach and duodenum were similar to one another; but that those in the duodenum were recorded about a second later than those in the stomach. Hunger pains developed during the experiment, and these again coincided with a rise of diastolic pressure.

The rapid conduction of the large pressure waves from stomach to duodenum indicates that the pylorus must have been patent during the observation, which is opposed to Hurst's view[15] that gastric pain is caused by the ballooning of the pyloric part of the stomach against a closed pylorus by the peristaltic contraction. Dr. Edmund Spriggs and Mr. O. A. Marxer have very kindly allowed me to quote further evidence in the same direction. Their patient had a gastric ulcer high up on the lesser curvature which was examined radiographically during pain. Six rapid exposures were taken at one second intervals during the progress of a single peristaltic contraction. The latter caused a lateral movement at the site of the ulcer with an alteration in its shape, while during part of the cycle the pylorus was again widely patent.

In applying a theory of visceral pain to pathological states it is necessary to consider in the first place whether in the case of chronic peptic ulcer: (1) pain results from the mere contact of the ulcer with the gastric HCl; or (2) from the movement of the ulcer itself in course of the peristaltic wave; or (3) whether the ulcer itself is specially sensitive to pressure effects. The first suggestion is now so generally discredited that I need only mention the fact that pain may be present with peptic ulcer when there is no free HCl

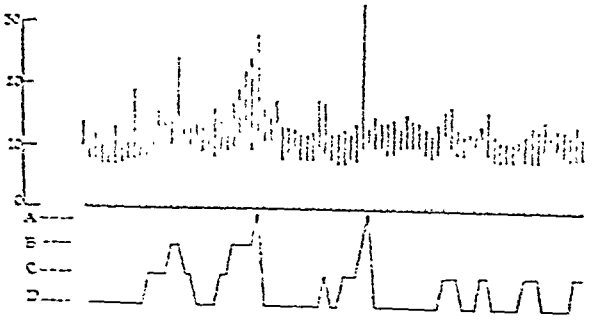
FIG. 7.



of the stomach. Further, the results of our experiments are entirely opposed to the suggestions that the HCl of the stomach (Bolton[21]) or the acrid contents of the stomach (Mackenzie,[1] pp. 131, 110), or organic acids (Maclean[22]) directly cause heartburn when they come in contact with the œsophageal mucous membrane. In an experiment on W. W. P., in which œsophageal pain had been produced mechanically, no sensation whatever was felt when a syringe full of the gastric contents containing free HCl was withdrawn and injected directly into the œsophagus. However, pain is produced in some cases by introducing HCl into the stomach, as Palmer[23] has shown. Presumably the explanation is that HCl produces primarily increase of tonus.

If the second suggestion were true the pain in peptic ulcer, as Bolton has pointed out, might be expected to differ in its nature and time relation from the pain in other conditions where there is no lesion of the visceral wall; but it is now generally recognised that it may be absolutely impossible to distinguish between the dyspepsia of peptic ulcer and gastric carcinoma and the reflex dyspepsias of

FIG. 8.



A. Eructation. B. More pain. C. Less pain. D. No pain.

gall-stones, cholecystitis, appendicitis, and even pancreatitis on the symptomatology alone. Surely the mechanism of the pain must be the same in all these. I should like to mention briefly a case imitating duodenal ulcer. A man, aged 49, had hunger pains, and the small transverse stomach regarded as typical of duodenal ulcer, but no occult blood in the stools. An experienced surgeon said that he was convinced that a duodenal ulcer would be found in spite of negative X ray evidence, but operation disclosed chronic pancreatitis. Furthermore, Payne and I have brought forward evidence that the pain of peptic ulcer is often produced in the œsophagus—i.e., somewhere away from where the lesion is situated.

The third suggestion might be put forward in this form—viz., that peptic ulcer, like other more distant lesions, may produce reflex œsophageal pain: but that in the stomach and duodenum the pain occurs at a lower diastolic tension owing to special sensitivity of the ulcer. Against this view I can bring forward some evidence.[22] In two cases, one of gall-stones and another where gastric and duodenal ulcer had been excluded by operation, abdominal pain was associated with a rise of intragastric pressure; but this was no higher than was the case in our patients suffering at the time from peptic ulcer.

I would support the view that visceral pain is an affair of the whole visceral wall and not of any isolated lesion in it, and that peptic ulcer produces painful effects secondarily by causing reflex increase of tone. Sensation is discontinuous while peristaltic waves are passing, but continuous without them. Further, pain is produced in exactly the same way in any reflex dyspepsia or even when a meal of badly masticated food has been eaten too rapidly. The ulcer *may* produce these reflex effects because it breaks the continuity of the muscle and in a sense acts like a foreign body.

There is evidence in the literature that raised diastolic pressure, which usually means raised diastolic tension, is the factor on which gastric sensation depends. Thus Carlson[12] (p. 67) stated that a certain degree of constant (or tonic) contraction in the empty stomach appears to give rise to a continuous hunger sensation. The interesting observations of Reynolds and MacClure[24] must also be considered. In 10 out of 12 patients they found, by means of X ray examination, a modification of the gastric movements during pain. The peristalsis might be exaggerated, it might die away altogether, or it might become irregular and then die away altogether, or an incisura might be developed. These latter observations show

After a prolonged experiment entailing much pain cutaneous hyperæsthesia was once felt by W. W. P. over the lower part of the sternum, and several times some ten minutes to one hour after the removal of the bag a pain was felt behind at the angle of the left scapula, as if the muscles were stiff, and there was tenderness on palpation. Another subject who kindly volunteered on one occasion felt pain in the back when the bag contained 40 c.cm. Further, we have to record that experiments of this kind may produce unpleasant results subsequently. Thus E. P. P., who never has indigestion, woke up with quite a severe attack on the day following a painful experiment, and W. W. P. has found that his dyspepsia was made worse by the experiments, and even more than two and a half years after the last experiment he still feels a little uncomfortable after breakfast. We may assume that these experiments caused damage to the structures in the wall. Obviously there is no fundamental distinction between pain produced experimentally and the pain of organic visceral disease.

CLINICAL APPLICATIONS.

Payne and I [22] have described an interesting clinical case, which would seem to have a direct bearing on the experiments just described. The patient, W. P., was a man aged 36 with severe gastroptosis who came to out-patients at Guy's complaining of two pains, which he had not noticed before, one at the top of the sternum and the other at the xiphisternum. A radiogram (shown as a sketch in Fig. 3 (E)) had a remarkable appearance, since most of the intrathoracic part of the œsophagus exhibited a constant dilatation, the walls of which were shown up by the trickling down of the barium. There were two constrictions filled with barium, one above the level of the arch of the aorta and the other about where the œsophagus passed through the diaphragm. Comparing this picture with the picture of the air bags in the œsophagus it certainly suggests that in this case the œsophagus produces pain by acting as its own air bag, the air being prevented from escaping by means of the two constrictions. The explanation as to why pain was felt at the top and bottom of the œsophagus rather than in the middle where the dilatation was greatest is probably given by experiments of Boring,[23] who showed that with pressure exerted at different levels in the œsophagus the tendency was to refer the pain above or below, rather than to an intermediate level, and this is decidedly borne out by our own experience.

Owing to the exigency of space in the hospital medical X ray room we were compelled to use a much simpler method than that already described in order to observe the movements in our clinical cases. A finger-stall was tied on to the end of a Ryle's tube and was connected by a T-piece with a syringe and a manometer. The whole system was filled with water and the position of the small bag was determined by X rays which showed up the lead weight at the bottom of the Ryle's tube and the small metal collar inside the Ryle's tube on which the finger-stall was tied. This was marked on the surface of the body and the corresponding level on the manometer tube was determined by means of a straight edge and a spirit level. One of us called out every 5 seconds while the other noted the level of the manometer and the amount of the excursion, and the patient said whether his pain was severe or not at the same time.

The patient W. P. was examined after admission to the hospital, when his œsophageal symptoms had improved, and it was noted that the pain was usually connected with a rise of pressure which was sometimes very great and was due to a peristaltic wave. Close inspection showed that the pain usually increased just when the relaxation was beginning and sometimes the contraction diminished the pain, thus fitting in with the experimental results on ourselves. Between the contractions the pressure was negative, as is usually the case in the intrathoracic part of the œsophagus. We did not carry out observations at the same time as Fig. 3 (E) was obtained, or otherwise the whole of the intrathoracic œsophagus must have shown a positive diastolic pressure. Observations on my colleague showed that positive diastolic pressures in the œsophagus may be obtained (Fig. 7). They were made at lunch time, when the subject was distinctly hungry. A relatively high diastolic pressure was observed when the bag was 1 cm. above the cardia, and at x a burning pain was felt just before the highest excursion of the manometer was obtained. As the bag was raised the pressure fell steadily; but it was still positive at 14 cm. above the cardia, which was the highest position at which the bag could be retained. However, at this time the œsophagus had become less excitable, since a lower pressure was obtained when it was again lowered into the neighbourhood of the cardia. I will also quote observations on the lower end of the œsophagus in the case of a patient 63 years old who had been treated medically for juxta-pyloric ulcer. On June 10th he complained of continuous pain which fluctuated in intensity and was situated in the mid-line about the lower end of the sternum. The diastolic pressure was found to be uniformly high—about 30 cm.—and the systolic excursions were not very large—about 15 cm. When the second experiment was carried out on June 23rd pain had been absent for some days. The presence of the bag excited the œsophagus to some extent to begin with, but soon the pressure settled down to quite a low level—about 5 cm. At the end of the experiment he swallowed; a very big rise of pressure of about 45 cm. followed, and it is interesting that the systolic pressure was as high as any obtained on the previous occasion, when the patient complained of pain. We carried out a number of similar experiments, and we always found that substernal pain due to dyspepsia was associated with activity of this kind.

As an illustration of the causation of gastric pain I will quote the case of a patient—P. F.—a labourer, aged 62, who had had a gastric ulcer in 1909, for which gastro-jejunostomy was performed. This relieved him of his symptoms for a time. The pain then returned and he was operated on again in 1920, when an ulcer was found on the lesser curvature adherent to the liver. The stomach was opened and the ulcer cauterised without affording him any relief. He vomited sometimes and complained of flatulence. X ray showed that the barium passed immediately through the gastro-jejunostomy opening, while the stomach was often over-distended with air. At first, when the stomach was examined, there was very slight pain, and the pressure was about 10 cm. of water, which is about normal. Then the pain suddenly became very severe, and this was associated with a rise of diastolic pressure while big systolic contractions also appeared. While these observations were in progress the level of the manometer suddenly fell, while the large systolic contractions still continued. At the end of the experiment it was observed by X rays that the bag had passed through the stoma and had taken up its position quite low down in the loop of the jejunum. If the zero is corrected for this fall the diastolic and systolic pressures remain very much the same in the jejunum as in the stomach. The pain was felt all the time in the epigastric angle, which was rather higher than the part that was being investigated, though at other times he noticed pain below the umbilicus. Another patient, J. Ch., aged 42, was a case of duodenal ulcer. He had had severe pain for five years coming on one and a half hours after food and accompanied by headache. X ray showed a small transverse stomach which was emptied in one and a half hours. There was also hyperchlorhydria. One of many observations on the duodenum is shown in Fig. 8. But exactly similar results were also obtained in the stomach. He was able to grade his pain, and it will be noticed that as this became more severe the diastolic pressure rose and an eructation often followed, after which the diastolic pressure always fell, to rise again in a minute or so's time. These periodic rises of diastolic pressure in stomach and duodenum with resulting symptoms were always obtained when the patient was fasting; but after a

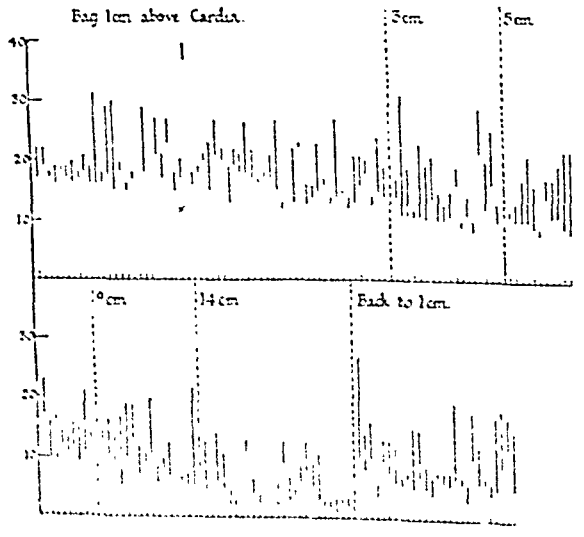
meal the pressure was lower, while the record remained flat and the patient was quite comfortable with no sensations.

We carried out further observations on this patient to find out the relation between the contractions of the stomach and the duodenum by means of two bags each attached to a manometer, while the excursions of both manometers were recorded on a kymograph. It was found that the systolic rises of pressure in the stomach and duodenum were similar to one another; but that those in the duodenum were recorded about a second later than those in the stomach. Hunger pains developed during the experiment, and these again coincided with a rise of diastolic pressure.

The rapid conduction of the large pressure waves from stomach to duodenum indicates that the pylorus must have been patent during the observation, which is opposed to Hurst's view[15] that gastric pain is caused by the ballooning of the pyloric part of the stomach against a closed pylorus by the peristaltic contraction. Dr. Edmund Spriggs and Mr. O. A. Marxer have very kindly allowed me to quote further evidence in the same direction. Their patient had a gastric ulcer high up on the lesser curvature which was examined radiographically during pain. Six rapid exposures were taken at one second intervals during the progress of a single peristaltic contraction. The latter caused a lateral movement at the site of the ulcer with an alteration in its shape, while during part of the cycle the pylorus was again widely patent.

In applying a theory of visceral pain to pathological states it is necessary to consider in the first place whether in the case of chronic peptic ulcer: (1) pain results from the mere contact of the ulcer with the gastric HCl; or (2) from the movement of the ulcer itself in course of the peristaltic wave; or (3) whether the ulcer itself is specially sensitive to pressure effects. The first suggestion is now so generally discredited that I need only mention the fact that pain may be present with peptic ulcer when there is no free HCl

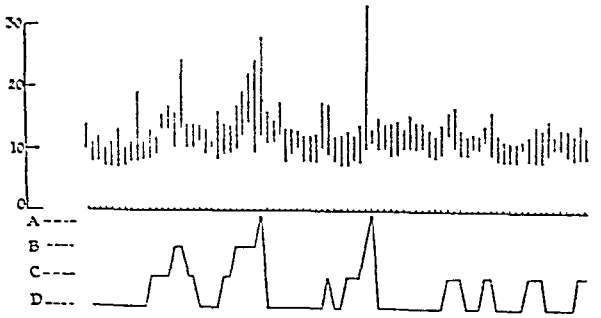
FIG. 7.



of the stomach. Further, the results of our experiments are entirely opposed to the suggestions that the HCl of the stomach (Bolton[21]) or the acrid contents of the stomach (Mackenzie,[3] pp. 134, 110), or organic acids (Maclean[22]) directly cause heartburn when they come in contact with the œsophageal mucous membrane. In an experiment on W. W. P., in which œsophageal pain had been produced mechanically, no sensation whatever was felt when a syringe full of his gastric contents containing free HCl was withdrawn and injected directly into the œsophagus. However, pain is produced in some cases by introducing HCl into the stomach, as Palmer[23] has shown. Presumably the explanation is that HCl produces primarily increase of tonus.

If the second suggestion were true the pain in peptic ulcer, as Bolton has pointed out, might be expected to differ in its nature and time relation from the pain in other conditions where there is no lesion of the visceral wall; but it is now generally recognised that it may be absolutely impossible to distinguish between the dyspepsia of peptic ulcer and gastric carcinoma and the reflex dyspepsias of

FIG. 8.



A. Eructation. B. More pain. C. Less pain. D. No pain.

gall-stones, cholecystitis, appendicitis, and even pancreatitis on the symptomatology alone. Surely the mechanism of the pain must be the same in all these. I should like to mention briefly a case imitating duodenal ulcer. A man, aged 49, had hunger pains, and the small transverse stomach regarded as typical of duodenal ulcer, but no occult blood in the stools. An experienced surgeon said that he was convinced that a duodenal ulcer would be found in spite of negative X ray evidence, but operation disclosed chronic pancreatitis. Furthermore, Payne and I have brought forward evidence that the pain of peptic ulcer is often produced in the œsophagus—i.e., somewhere away from where the lesion is situated.

The third suggestion might be put forward in this form—viz., that peptic ulcer, like other more distant lesions, may produce reflex œsophageal pain; but that in the stomach and duodenum the pain occurs at a lower diastolic tension owing to special sensitivity of the ulcer. Against this view I can bring forward some evidence.[22] In two cases, one of gall-stones and another where gastric and duodenal ulcer had been excluded by operation, abdominal pain was associated with a rise of intragastric pressure; but this was no higher than was the case in our patients suffering at the time from peptic ulcer.

I would support the view that visceral pain is an affair of the whole visceral wall and not of any isolated lesion in it, and that peptic ulcer produces painful effects secondarily by causing reflex increase of tone. Sensation is discontinuous while peristaltic waves are passing, but continuous without them. Further, pain is produced in exactly the same way in any reflex dyspepsia or even when a meal of badly masticated food has been eaten too rapidly. The ulcer *may* produce these reflex effects because it breaks the continuity of the muscle and in a sense acts like a foreign body.

There is evidence in the literature that raised diastolic pressure, which usually means raised diastolic tension, is the factor on which gastric sensation depends. Thus Carlson[13] (p. 67) stated that a certain degree of constant (or tonic) contraction in the empty stomach appears to give rise to a continuous hunger sensation. The interesting observations of Reynolds and MacClure[24] must also be considered. In 10 out of 12 patients they found, by means of X ray examination, a modification of the gastric movements during pain. The peristalsis might be exaggerated, it might die away altogether, or it might become irregular and then die away altogether, or an incisura might be developed. These latter observations show

that the pain had nothing to do with the peristalsis by itself, but it can be explained on our theory as due to increased tonus developing. The same absence of peristalsis was noticed in some of our more painful œsophageal experiments already described. But though continuous, visceral sensation may result from tonus without contractions, I would emphasise the fact that in our clinical cases increased tone and increased peristalsis were usually found together.

During the past ten years or so several papers on the subject of gastric pain have been published by American observers with very conflicting results. In many cases the relation of pain to gastric movement was clearly demonstrated; but in others no such relation was established, and W. L. Palmer,[25] in summing up his conclusions, says that "the pain producing mechanism is not usually dependent on gastric or duodenal tone or motility of pylorospasm; but under certain conditions normal gastric peristalsis may constitute the adequate stimulus." The following criticisms may be brought against all this work: (1) An air bag was usually employed, located in the fundus. The advantage of our small water bag is that it can be readily passed into the pyloric part of the stomach and beyond. We found that in the elongated stomach when the walls sagged together no movements at all were transmitted from the pyloric part of the stomach to the fundus. (2) The air bag was apparently blown up tight and no actual figures are given for the intragastric pressure. Under these conditions the air bag would be more liable to act as a foreign body than our small water bag. This is illustrated by the radiograms of Rogers and Hardt.[26] (3) Often no account is taken of the place where pain was felt, but in these experiments it is essential to differentiate between œsophageal and gastric pain. (4) The mere introduction of 200 c.cm. or more of fluid into the stomach by increasing the radius will increase the tension of the wall and so cause pain, even though there is no increase of pressure recorded, and the discrepancy in some of Palmer's observations may be due to this. Taking all these things into consideration it is not very surprising that in many cases the relation of pain to the mechanical condition of the various organs was often not established.

However, on examining those published cases where pain was found to be related to gastric movement I find that they are divisible into two groups. In one the peristaltic wave has a clearly defined pointed summit, and in this case the sensation is recorded during the relaxation. The earliest example of this kind was published by Carlson [27] (Fig. 1), and he draws the conclusion that "gastric contractions preceded the ulcer sensation just as they preceded the hunger pang." He has further stated that "when the stomach contraction is of moderate severity and the hunger sensation of moderate intensity the hunger sensation gradually ceases at the height of the contraction." A similar observation has been published by Palmer [25] (Fig. 6) and by L. L. J. Hardt [28] (Fig. 3 (A)). It is also interesting that W. H. Ogilvie [29] observed that a patient whose gall-bladder was intubated complained of pain as the pressure fell at the end of a contraction. These observations surely provide the direct clinical proof of the correctness of our theory that a successful peristaltic contraction relieves visceral pain which appears again when the condition of tension on the nerve-endings becomes re-established during peristaltic relaxation. It is true that Carlson [27] and Hardt [28] have suggested that this result may be explained by the pain being produced by contraction of the pyloric end of the stomach, which occurs some seconds after the contraction of the fundus in which the bag is situated. But this suggestion does not give a true picture of events in the stomach. We have found by simultaneous X ray and manometric observation of one case that the peak of the pressure wave corresponds with the deepest indentation of the greater curvature, while the peristaltic wave sweeps round towards the pylorus. The pressure changes are communicated simultaneously through the stomach, and in the case of J. Ch. very rapidly to the duodenum. Thus we may conclude that the end of the peristaltic wave recorded in the fundus is simultaneous with the end of the wave produced in the pyloric part of the stomach. But this is a point that Dr. L. T. Ride and myself are further investigating by two small similar bags in different parts of the stomach. The radiograms of the bags in situ by Rogers and Hardt [26] suggest that the stomach acts as a whole as far as pressure is concerned, since the bag which occupies the greater part of the stomach is clearly being compressed above and below simultaneously.

Again, a graphic record has been published by Palmer [25] (Fig. 7), in which the peristaltic wave has a flat top of some seconds' duration, and in this case the pain coincides with the contraction. It is reasonable at present, I think, to regard this flat-topped wave as being due to a sustained peristaltic contraction which is held up in its course, possibly owing to pylorospasm, so that a condition of painful strain is set up similar to that occurring with the incompressible bag in the œsophagus.

At the end of the previous section we stated that on theoretical grounds the very beginning of a peristaltic wave might be painful. We have some evidence of this from our clinical investigations. For example, W. W. P. (Fig. 7) noticed pain before the highest excursion of the manometer. It is clear that further work on this point is required.

The experiments of A. W. Mayer have been dealt with elsewhere,[18] but it is to be noted that the addition of barium chloride to the peritoneal cavity, which he found to be a cause of pain in certain animals, produces exactly that condition of high tone and held-up peristalsis that we have already shown to be the cause of visceral pain. Further, Mackenzie's [11] observation that pain was associated with the contraction of the bowel into a thick fleshy rod and Ryle's [30] observation on the pain and tenderness of a spastic colon may be explained in the same way.

An Address

ON

SACRO-ILIAC PAIN

Opening Discussion at a Meeting of the Medical Society of London on Dec. 10th

BY WILFRED HARRIS, M.D. CAMB., F.R.C.P. LOND.,

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DURING the last ten years increasing attention has been paid to the slighter forms of sacro-iliac disease, both in this country and in America. Although Fleming in this country and Bertherand in Belgium had described dislocation of this joint as long ago as the middle of the nineteenth century, it was not until Goldthwait of Boston, in 1905, forced the subject upon the notice of the profession, that relaxations and subluxations of the sacro-iliac joint became generally recognised as a source of the low back pain and chronic sciatica met with chiefly in women, following slight injuries, childbirth, postural relaxation under an anæsthetic, or similar muscular and ligamental strains, such as may be met with in football, wrestling, and in the lifting strains of industrial occupations. A not uncommon cause of the post-operative backache, usually met with in women, is due to the prolonged relaxation of the back muscles during an anæsthetic while lying on a flat table, when the surgeon has omitted to place a cushion under the small of the back.

ANATOMICAL FEATURES.

The sacro-iliac joint is what is known as a diarthrodial joint, is lined by cartilage, and has a synovial cavity, best marked in the female at the time of childbirth. The facets of articulation between the

ilium and sacrum are somewhat auricular in shape, and in the erect position the weight of the body transmitted through the lumbar vertebræ to the sacrum produces a shearing strain in the two sacro-iliac joints, tending to force the sacrum downwards between the two ilia. The joints are supported mainly by the anterior and posterior sacro-iliac ligaments, of which the posterior is by far the stronger and most important, so strong indeed is it that it has been found impossible to rupture it experimentally, the bony surfaces tearing away first. In addition, the glutei and erector spinæ, by their tonic contraction acting on the sacrum and ilium, help to support the joint. In the male there is usually sufficient joint locking to prevent any but the smallest movement, but in the female pelvis the bony surfaces are smoother and the joint capable of greater range of movement, especially during parturition. It is therefore in the female more particularly that sacro-iliac strains and subluxations are liable to occur, owing to the two factors of greater mobility of the joint and weaker muscles.

Types of Sacro-Iliac Lesions.

As already said, the ligaments are practically impossible to rupture, and therefore we shall not expect ever to find a true downward dislocation of the sacrum, but a torsion or partial rotation of the joint, in which the sacrum may tilt either forwards or backwards upon its articulation with the ilium. The commoner form is that in which the sacrum is rotated backwards, producing "flat back," with more or less obliteration of the normal lumbar curve, such as may occur after a prolonged anæsthetic. In the relaxation form of subluxation, produced by prolonged standing, especially in heavy women with pendulous abdomens, the sacrum may be tilted forwards, causing an exaggerated lordosis, with symptoms of dull chronic feeling of fatigue, with pains in the lower back, radiating up the spine. In this type there is no hamstring spasm present, though in the flat back variety spasm of the hamstring muscles becomes so severe that extension of the leg upon the thigh flexed on the abdomen becomes impossible without considerable pain referred to the affected joint.

Diagnosis of these subluxations by X rays appears to be impossible except in rare cases, and this has been cited as a reason for doubting the possibility of their occurrence in any frequency. Whenever possible to obtain, stereoscopic X ray pictures of the pelvis should be insisted on, and lateral as well as antero-posterior views.

Clinical experience of these low back pains, fortified by their speedy or even sudden and dramatic relief by measures calculated to reduce such subluxations, should convince us of their importance in the symptomatology of chronic pains in the back, which have been in the past, and indeed still are diagnosed variously as lumbago, muscular rheumatism, and chronic sciatica.

These strains of the joint may be divided into three classes: (*a*) sudden or acute, (*b*) subacute, (*c*) chronic. An example of the sudden form will be that resulting from a violent blow, as in a motor accident, or from a fall.

Some weeks ago I saw a lady who was supposed to be suffering from chronic sciatica. She was in constant pain and unable to get about much, limping on the right leg and complaining of pain down the back of the leg, and also around the hip into the groin. She gave a history of sudden onset of the pain following an accident in her car, a small saloon, which was struck from behind by a heavy lorry, the blow jarring her right buttock and being followed instantly by local pain and difficulty in walking. There was local tenderness on pressure below the posterior superior iliac spine on the right side, with pain on compression of the iliac crests, while the Achilles jerk was normal, and her spine was somewhat rigid and appeared to have lost somewhat of the lumbar curve. I came to the conclusion that it was a case of true sacro-iliac subluxation due to direct injury, and handed her over to Mr. E. F. Cyriax for manipulative treatment, with excellent results.

The acute form of sacro-iliac lesion is liable to be produced by a heavy lifting strain when stooping, when the sensation may be felt as of something snapping, followed by a difficulty in holding the body erect, with the appearance of sharp pain in the lower lumbar region. This pain may disappear after a rest, reappearing and becoming worse next day, causing practically complete disablement, the pain being at first localised in the region of the joint, and later spreading through the whole lumbar region, buttock, and leg on the affected side. Mr. P. J. Verrall has well described the patient's sensation as one of extreme instability, and of "falling to pieces."

Nerve Relationships.

All the nerves in the neighbourhood of the joint supply it with articular branches, the nerve-supply being thus derived from the lumbo-sacral cord, the first and second sacral nerves, the obturator, and the superior gluteal. The lumbo-sacral cord, which it will be remembered is made up of a large branch from the fourth lumbar anterior division to join the fifth lumbar nerve, passes downwards and outwards in front of the lower third of the sacro-iliac joint on its way to join the first sacral nerve and the sacral plexus. Since this lumbo-sacral cord is an anterior relation of the joint it is no matter of surprise that in disease of this joint neuralgic pain may be referred along the distribution of the sciatic nerve down the leg to the ankle and foot, while in other cases, through the obturator nerve, pain may be complained of in the region of the hip-joint and groin and even in the knee. Tenderness on pressure over the affected sacro-iliac joint is almost constant, and compression of the iliac crests or pressure on the pubes will cause pain referred to the affected joint. Pain will be aggravated by walking, by sitting on the affected side, by standing, or by lying flat on the back, while bending becomes difficult and lifting a weight almost impossible. The posture may be diagnostic, the lumbar curve either flattened or with an exaggerated lordosis, and the spine tilted to one side, usually away from the affected joint. In walking upstairs much disinclination is shown to throw the weight on the leg on the damaged side, more so than in osteo-arthritis of the hip-joint, which is one of the conditions which is liable to be confused with sacro-iliac joint disease. Goldthwait's symptom is pain referred to the joint or to the leg of the affected side when the leg is extended on the flexed thigh. When this test causes pain referred to the damaged sacro-iliac joint, it is probably caused by spasm of the hamstrings through their attachment to the ischial tuberosity pulling on the ilium and tending to force rotation of the ilium on the sacrum. This method may indeed be used to reduce the backward rotation of the sacrum, causing "flat back," but probably the better and less painful method is to exert pressure with one hand on the sacrum, while the other pulls the ilium backwards by gripping the anterior superior spine. When lordosis is exaggerated by a forward rotation of the sacrum, any forced hyperextension of the leg can only do harm, and rest in bed in the supine position is probably advisable. The treatment, however, of sacro-iliac subluxations, whether by manipulations under an anæsthetic or without, by strapping or other supports, or by the operation of permanently fixing the joint by arthrodesis, is beyond the scope of my opening remarks, and will no doubt be adequately dealt with by the surgeons.

Differential Diagnosis.

The differential diagnosis from sciatica, spinal cord disease, arthritis of the hip, lumbago, and sacral fibrositis are, however, of pressing importance from the medical point of view. It is the American surgeons particularly who have during the last ten years investigated and written upon the subject of sacro-iliac sprains, and have helped to rescue many sufferers with chronic pain in the back from the chiropractors, osteopaths, and other professors of manipulative movements. Goldthwait,[1] who in 1905 based his paper on 500 cases, went so far as to say

[1] Goldthwait, J. E.: Boston Med. and Surg. Jour., 1905, cit., 280.

that most cases of chronic sciatica are due to sacro-iliac subluxations.

Hoyt Cox,[2] of Chicago, also wrote last year: "Chronic sciatica is, of course, only a symptom, and is usually due to pressure or irritation of the sciatic nerve from some external source. However, it may be due to focal infection in rare cases." Without going so far as to accept this sweeping generalisation that chronic sciatica is usually a surgical disease, we should always be on our guard not to overlook injury or muscular strain damaging the sacro-iliac joint and simulating sciatica through its pain reference along the lumbo-sacral cord. This error we shall be less liable to fall into if in our routine examination of the patient we always test for tenderness over the joint by pressure on and below the posterior iliac spine, and also try the effect of compression of the iliac crests. When neither of these tests causes pain referred to the joint, we shall be fairly safe in excluding sacro-iliac sprain.

Again, Lasègue's sign in sciatica is the production of pain referred along the nerve when the leg is extended on the flexed hip, a sign already claimed by Goldthwait as due to sacro-iliac subluxation. There can be no question that this sign is commonly present in many acute sciaticas, and may still be present when the acute stage has passed into the chronic stage, so we shall probably err on the side of safety if we do not accept the whole of Goldthwait's dictum, but limit the value of his sign of sacro-iliac sprain to those cases in which the pain is referred to the actual joint region, whether or no there is also pain referred down the leg.

Chronic Sciatica.

A valuable sign in subacute and chronic sciatica is loss of the Achilles jerk, indicating that the neuritic process has passed inwards from the nerve sheath and is actually involving the nerve bundles. This is probably the earliest sign indicating actual damage to the nerve-fibres, invariably preceding anæsthesia of the foot or muscular wasting, and usually to be found before the patient complains of coldness, numbness, or blueness of the foot. The posture in sciatica may give rise in certain cases to a suspicion of sacro-iliac sprain or subluxation. Though there may be tilting of the spine to the same or to the opposite side, there will be none of the extreme disability described by Verrall as "falling to pieces," with the extreme disinclination to throw the weight on the hip of the affected side in going upstairs. In some cases of chronic sciatica the tilting to the same side is so great that the patient appears drawn down on that side, limping with knee bent, and a homolateral scoliosis. In that type the Achilles jerk may be lost, and the site of the peri-neuritis is at the sciatic notch, and affects the upper two or three inches of the nerve in this region. This type is often curable by massive saline injections into the nerve.

Another rarer type, in which contra-lateral scoliosis is a marked feature, is more chronic even than the last as a rule, there is no loss of the Achilles jerk, no muscular wasting or numbness of the leg, but pain is complained of in the sciatic distribution, and there is often tenderness on deep pressure over the region of the fourth lumbar transverse process on the affected side. The spine is tilted towards the opposite side, sometimes as much as five inches when a plumb line is dropped from the seventh cervical spine, and pain down the affected leg is produced by forcibly pulling the shoulders towards the affected side when counter pressure is kept up by the knee against the patient's hip. The tilting is not due to the pelvis being thrown to one side with the heel raised, as with both heels on the ground the crests of the ilia are perfectly level. The cause of this type of sciatica appears to be some inflammatory lesion, such as fibrositis, irritating one or more nerve-roots close to the intervertebral foramina. The tilting of the spine is a protective scoliosis, so as to open out as far as possible the inter-vertebral foramina on the affected side. I have seen one such case of left-sided sciatica, with lateral scoliosis towards the right, which was cured instantaneously by an injection of alcohol deeply into the tender area behind and below the left fourth lumbar transverse process. Saline injections into the nerve I have found of no value in this type of sciatica, but they usually recover after prolonged rest in bed, aided by massage, radiant heat, and ionisation. It is clear, therefore, that these cases are to be distinguished from sacro-iliac sprains, and have nothing in common with them.

Traumatic Sciatica.

Chronic sciatica may be the result of a fall on the buttock, actual contusion of the nerve probably resulting from the injury. I have seen such a case recover in less than a week after massive saline injection into the nerve at the notch, though the pain and disability had already lasted for many weeks following a fall in the hunting field. Similarly, another case of a coal-miner, when walking along an underground gallery, in order to save himself from being run down by a trolley load of coal, had to throw himself suddenly sideways, falling on a mass of loose debris. Immediately he felt severe pain in the buttock and was unable to rise, the pain later spreading downwards like a sciatica. After three months of constant pain and disability he was sent up to St. Mary's Hospital where I injected the sciatic nerve at the notch with 80 c.cm. of saline. His cure was most dramatic and almost instantaneous. This was many years ago, before I knew anything of sacro-iliac sprain, and if I saw such a case now I should carefully examine him from this point of view, but the result of his treatment is proof that his sciatic nerve and not his sacro-iliac joint was at fault, the nerve probably being irritated by fibrositic scar at the notch, resulting from a ruptured muscle bundle and hæmorrhage.

It was from Mr. Blundell Bankart that I first learnt several years ago how easy it may be to mistake sacro-iliac sprain for a chronic sciatica. I had been treating a lady for some time with rest in bed, and had given her two saline injections into the nerve without benefit, when he was called in, made the diagnosis of sacro-iliac subluxation, and manipulated the pelvis under an anæsthetic, getting the "click" that is said to occur as the joint slips into place, with a resulting immediate cure. The meaning of this click has been variously explained, some authors saying that it is produced by rubbing of thickened fibro-cartilage in the joint, as the result of a chronic inflammatory process.

Sepsis.

Septic infection is an important cause of neuro-fibrositis and joint inflammations, and its influence was well shown in the case of a young married woman of 31, who had had periodic lumbar pain for five years following childbirth. For four months before I saw her she had been complaining of sciatic pain shooting down to the left ankle, with pricking pains in the calf. The Achilles jerk was normal, and there was general tenderness in the buttock, the pain appearing to come from the bottom of the spine. I was suspicious of sacro-iliac relaxation, owing to the history of pain following childbirth, but could get no evidence confirmatory of this on testing. The pain was aggravated by coughing or sneezing and by extension of the knee on the flexed hip, and she was unable to wear a high-heeled shoe, as it increased the pain. No treatment appeared to be of any avail, and the pain continued for some months until a septic molar tooth was extracted, when all the symptoms cleared up in a few days.

OTHER CAUSES OF PAIN IN THE BACK AND LEGS.

This is not the place to enumerate all the various causes of sciatica, which are legion, but in the differential diagnosis of sacro-iliac pain it is important to exclude diabetes. Tubercle may attack the sacro-iliac joint, with the formation later of a cold abscess.

[2] Cox, H. H.: Surg., Gyn., and Obst., 1927, xlv., 637.

Tubercle of the sacrum or of the lumbar vertebræ may be recognised by radiography, though new growths in the rectum or in the pelvis, or of the lumbar cord or cauda equina may show nothing on radioscopic examination without special arrangements. An opaque enema may be of the greatest assistance in the radioscopic examination of the rectum and colon, while tumours within the spinal theca damaging the nerves or cord may be indicated by X rays after an injection of lipiodol by cistern puncture, the heavy opaque oil falling down through the cerebro-spinal fluid to the site of the tumour, where it is held up and prevented from reaching the conical termination of the thecal cavity at the level of the first sacral body.

Clinically, such tumour should produce symptoms of muscular wasting and anæsthesia, according to the roots involved, with appropriate loss of reflexes, thus the knee-jerks will not be affected by lesions below the fourth lumbar root, the Achilles jerk being served by the first sacral.

Sacralisation.

Sacralisation, or semi-sacralisation of the fifth lumbar vertebra, is another cause of low back pain, with or without pain referred along the sciatic nerve. This process of sacralisation consists usually of a much enlarged transverse process on one side which may articulate either with the top of the sacrum or with the iliac crest. All degrees are met with up to total bony ankylosis of the fifth lumbar vertebra with the sacrum. Owing to the fact that the fifth lumbar nerve is the largest of the lumbar nerves, whilst its foramen between the fifth lumbar vertebra and the sacrum is the smallest of the lumbar foramina, congestion of the venous plexus around the nerve or a rheumatic or infective fibrositis may very easily lead to compression of the nerve, and thus a referred sciatica is set up, and even symptoms of definite neuritis, with wasting of the leg muscles below the knee. Sacralisation is only rarely found in Europeans, and is a retrograde developmental anomaly, being commonly found in non-European races, and almost invariably in the anthropoid apes.

Osteo-Arthritis.

Osteo-arthritis of the hip-joint is a fertile cause of error in the diagnosis of sciatica, and may similarly be mistaken for sacro-iliac sprain. The pain is usually around the hip into the groin, and even into the knee, while rarely the only pain complained of may be below the knee down to the ankle. On examination, there will usually be found limitation of rotation and of abduction of the hip, with pain on movement, the pelvis tending to move as a whole with the thigh movement. X rays will show mushrooming of the head of the femur, loss of the articular cartilage, and disappearance of the articular space, with lipping from osteophytes at the edges of the acetabulum. Many of these cases are, however, complicated by the presence of true sciatica in addition. Since the nerve passes very close to the back of the joint, it is not surprising that the chronic inflammatory process giving rise to osteo-arthritis of the hip may also invade the sheath of the sciatic nerve.

X rays have comparatively recently demonstrated a number of cases of *osteitis deformans*, or Paget's disease of the bones, invading the ischium and other bones of the pelvis and producing symptoms that are easily mistaken for chronic sciatica.

Just as sacro-iliac enthusiasts in America have asserted that nearly all chronic sciaticas are really sacro-iliac sprains or subluxations, so also have similar assertions been made by spa physicians that all sciaticas are really secondary to osteo-arthritis of the hip. Steering a middle course between these all-embracing claims, we may yet learn a good deal from them, and will hesitate to diagnose true chronic sciatica without a careful X ray examination to exclude arthritis of the hip or other bony disease, and at the same time we must not forget to examine for cauda equina disease.

TREATMENT AND PREVENTION OF NON-OBSTRUCTIVE SUPPRESSION OF URINE.

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Suppression of urine is at all times a serious symptom and one which calls for prompt treatment. It is, moreover, a condition which is liable to occur at any time and is always to some extent an emergency. Measures for relief, to be successful, must be readily applicable, and must not require elaborate laboratory investigations. The procedure described here has been evolved during the course of a prolonged research on the treatment of nephritis and allied conditions with alkalies. Twenty-four cases of severe, partial, and complete suppression were met with, and as their suppression of urine always reacted satisfactorily to the treatment it was considered desirable to publish them separately in the hope that the measures might prove of value to others. No example of the prolonged complete anuria lasting from 10 to 14 days, described in text-books, has so far been met with, and until such cases have been successfully treated the method cannot be said to be infallible. Anuria of this extreme degree is so rarely encountered in the experience of one individual, however, that it seemed unwise to defer publication of what may prove a valuable therapeutic measure in milder cases.

Total or partial suppression of urine occurs in the following conditions:—

1. Acute nephritis.
2. Acute exacerbations occurring in the course of chronic nephritis, which are usually caused by (*a*) superimposed infection, (*b*) over-exertion, (*c*) the administration of general anæsthetics such as chloroform and ether, and the therapeutic use of certain heavy metals and metallic compounds such as lead, mercury, gold (sanocrysin), and arsenic (salvarsan).
3. Heart failure.
4. Fevers and inflammatory conditions.
5. Acute poisoning by phosphorus, turpentine, and the above-named metals.
6. Collapse after severe operations or the passage of a catheter.
7. Cholera and blackwater fever.

Total suppression may be present for 10 to 14 days before death in rare instances, but a fatal issue from respiratory or cardiac failure quite often occurs before this. Drowsiness, headache, vomiting, contracted pupils, and a subnormal temperature are usually present. Deep coma is comparatively rare, consciousness often being retained to the end. Convulsions are likewise rare or occur just before death. Irregularity of the pulse is a grave sign. Anuria, even when complete, is not necessarily fatal, whilst recovery from partial suppression is not uncommon. Nevertheless this symptom is always cause for grave anxiety as, when it does not itself lead directly to death from uræmia, the accumulated "toxic" substances act adversely on other organs and tissues which may or may not have been previously damaged. Anuria may therefore be a primary or secondary cause of death.

The treatment usually recommended consists of measures designed to promote elimination of waste products through the skin and bowels by means of hot baths, diaphoretics, and purges, whilst counter-irritation is applied to the kidneys in the form of dry cupping, hot applications, and warm colonic douches. Most writers point out that diuretics act best, if at all, after the secretion has once started. These proved remedies should always be tried, although they are not invariably successful. We believe that our method exerts a direct action on the kidney and initiates and maintains the secretion of urine. The underlying

* Working with the aid of a grant from the Medical Research Council.

theory, and the evidence upon which it is based, have been discussed at some length elsewhere.[1]

The cases of partial suppression described include only those in which the urinary output had fallen to six ounces or less in the 24 hours. No cases have been included in which the urinary output was on the increase when treatment was commenced. The distinction is important. The method consists simply in giving by mouth (or per rectum when coma is present) a mixture of alkaline salts in increasing amounts until diuresis is obtained. It has been found that in cases of suppression and of nephritis with oliguria there is an associated acidosis—acidosis being here defined as a condition in which the plasma bicarbonate is reduced (van Slyke). I do not propose to discuss now the relation of the acidosis to renal function—i.e., whether it is caused by or is the cause of the latter, but the plasma bicarbonate is decreased in many conditions in which there is no obvious impairment of renal function, and frequently, if not always, when there is suppression of urine. The plasma bicarbonate was markedly reduced in each of the nine cases in which it was estimated in this series. When this is the case alkalies can be given in comparatively large amounts without danger, and, as the present series of cases suggests, in amounts sufficient to produce diuresis. If further investigation confirms the findings recorded here, it may be said that the plasma bicarbonate is always reduced with suppression of urine, and that it will be safe to give alkalies in amounts sufficient to cause diuresis without a preliminary investigation of the bicarbonate content of the blood, as secretion of urine seems generally to begin when the bicarbonate has reached a normal level. Until this level is exceeded little danger is likely to ensue. The practice of giving alkalies in large amounts when the plasma bicarbonate is not known to be decreased cannot be too strongly condemned, as symptoms of alkalosis and tetany are likely to occur.

Procedure for Treatment.

A mixture containing grs. 30 each of potassium citrate and sodium bicarbonate, with some suitable flavouring agent such as syr. aurantii, minims 40, in an ounce of water, is given by mouth at hourly or two-hourly intervals until secretion begins or until it begins to increase. At this point the previously acid urine is usually definitely alkaline. In cases of coma a 3 per cent. solution of the mixture is given per rectum, or a drachm to the pint intravenously, and repeated until either diuresis is established or consciousness is regained, when oral administration is to be preferred. A light diet can be given throughout when desired, and no extra fluid need be given, but the minimum should be not less than three pints a day. The total quantity of fluid intake should be kept reasonably constant from day to day. The number of doses and the total amount of alkali required to start diuresis of course varies in each case, but it is absolutely essential that alkalies should be given continuously until diuresis begins. When the urinary output has reached 10 to 15 oz., and is seen to be still increasing, the alkalies must be reduced in amount, but *must not be withdrawn*. The total quantity of alkali given in the 24 hours may be reduced by one-third, but if this is followed by a decrease in urinary output the former dose must be resumed immediately. By thus carefully manipulating the dose it is usually possible to maintain a satisfactory diuresis. Complete withdrawn of alkali at the point at which secretion begins is sometimes followed by an anuria, and a second attempt to overcome this by means of alkalies generally demands a much larger dose than before, and this is often dangerous and frequently unsuccessful.

The essential points in the procedure are to give alkalies in increasing amounts rapidly until diuresis commences, then to reduce the dose sufficiently to maintain the flow, but not to the extent of causing a secondary decrease in the secretion. The patient requires unceasing attention and should on no account be left without expert supervision. The chief danger to be feared from overdosage is tetany, but this has not yet occurred in a case of suppression, probably because diuresis begins and the dose is reduced just before the tetany point—in quantity of plasma bicarbonate—is reached. Tetany produced by overdosage with alkalies is easily overcome by a slight reduction of the dose and by the intramuscular injection of one grain of calcium chloride in 40 minims of distilled water. The injection may be repeated two hours later if necessary. By far the greatest danger in tetany is complete withdrawal of alkalies. Chvostek's sign is generally present, and is an early and valuable warning of the approach of tetany due to over-dosage with alkalies.

The after-treatment consists in giving a dose of alkali sufficient to keep the urine definitely alkaline to litmus until the exciting cause of the suppression is overcome or removed.

CASE 1. *Albuminuria of pregnancy in labour, second pregnancy.*—The patient was a married woman aged 26. She had extreme œdema of legs, thighs, and face, and albuminuria was first noticed on Nov. 7th. She did not attend again until she was admitted in labour on Dec. 12th. On admission at 3 P.M. 2 oz. of urine were obtained by catheterisation, and contained much albumin. Labour commenced at 5 A.M. on Dec. 13th. At 2 P.M. there was no urine; the plasma bicarbonate was 0·0246, and the blood-urea 45 mg. per cent. She was given grs. 60 of alkalies two-hourly, but no urine could be obtained by catheter. At 1 P.M. on Dec. 14th the plasma bicarbonate was 0·0326, and the blood-urea 65 mg. per cent. The dose of alkalies was decreased to grs. 60 six-hourly. At 4 P.M. on Dec. 14th diuresis began. The urine had a hydrogen-ion concentration of 6 and contained 6 parts per 1000 of albumin. A full-term child was born at 7 P.M. on Dec. 14th, three hours after the diuresis had begun.

CASE 2A. *Parenchymatous nephritis.*—The case was that of a child of 3. There was a 15 months' history of general anasarca, with marked ascites, and the child had passed very little urine for three days before admission. He then passed 1 oz. a day for the next two days. The urine was very acid, loaded with albumin and casts, but contained no blood. He was given grs. 690 of alkali in 48 hours and the urine increased to 14 oz. and became alkaline to litmus. After further grs. 480, the volume increased to 70 oz. He was discharged with no œdema and with his urine free from albumin and casts.

(*b*) He was readmitted one year later with identical symptoms, having passed scarcely any urine for two days. In the first 24 hours after admission he passed 3 oz. of very acid urine, loaded with albumin and many casts, but no blood. After grs. 560 of alkali, given during the next 24 hours, he passed 8 oz. After further grs. 480 the output increased to 22 oz. The dose was maintained at grs. 480 per diem, and the volume of urine gradually increased to 40 oz. a day. He was discharged without œdema and free from albumin and casts.

CASE 3. *Chronic pyelonephritis.*—The patient was a girl of 16. She had had puffiness of the eyes and headaches for four years. On admission she was unconscious and there was some twitching of the extremities. The urine was acid, contained albumin, a little blood, and many coliform bacilli. The face and legs were œdematous. The urinary volume averaged 20 oz. for some days and then decreased and finally none at all was passed for three days. At this point the plasma bicarbonate was 0·026 mg. per cent., and the blood-urea was five times normal. She was given grs. 360 of alkali by the mouth, and this was followed by secretion of urine and return of consciousness. Thereafter an adequate diuresis was maintained on a daily dose of grs. 200 and all the symptoms cleared up. Eighteen months later she was still attending the out-patient department for observation.

CASE 4. *Sanocrysin poisoning.*—This was a case of infective endocarditis in a girl aged 17½, in which subsidence of the temperature and reduction in the size of the spleen had followed a small dose of sanocrysin on several occasions. Three days after a somewhat larger dose than usual the urine rapidly decreased in amount and contained albumin. For three days there was complete anuria with partial coma and uræmic twitchings of the extremities. At this point the plasma bicarbonate was 0·022 molar, and the blood-urea was between four and five times the normal. She was already having grs. 110 of alkali a day and this was increased to grs. 60 hourly. At the end of 24 hours, when she had had grs. 1110, she had passed 20 oz. of urine. The dose was then reduced to grs. 480 a day and the secretion of urine continued in adequate amounts. She became fully conscious and all signs of uræmia disappeared. Later the dose was still further

reduced and she was sent home with her renal condition recovered. I am indebted to Dr. G. Marshall for permission to publish this case.

CASE 5. *Chronic parenchymatous nephritis.*—The patient was a boy of 4. There was a three months' history of generalised œdema and ascites and he had been passing very little urine for some days. He was very drowsy and his urinary output was only 5 oz. in the first 24 hours after admission. It was acid, solid with albumin, and contained many casts and a little blood. The plasma bicarbonate was 0·0163 molar. After he had had grs. 120 of alkali, he passed 8 oz. of urine and after grs. 210 he passed 18½ oz. and the bicarbonate rose to 0·021 molar. After grs. 1380 he passed 26 oz. of urine, with a hydrogen-ion concentration of 8·3.

CASE 6. *Chronic pyelonephritis.*—The patient, a woman, aged 32, was admitted with headache, vomiting, purpura, uræmic twitchings, and almost complete suppression of urine. The blood-urea was 620 mg. per cent. She was given grs. 720 of alkali and passed 12 oz. of urine, which was neutral to litmus. The dose was maintained at grs. 720 for another 24 hours, and 32 oz of urine were passed. The hydrogen-ion concentration was 7·2 and the urine contained 1 part per 1000 of albumin. The plasma bicarbonate was 0·033 molar and the blood-urea 550 mg. per cent. It was decided to continue the dosage at grs. 480 per diem, and later she passed 46 oz. of urine in the 24 hours.

CASE 7. *Acute nephritis 15 days after tonsillitis.*—The patient was a boy aged 8. The average output of urine was 2 oz. a day for four days. The blood-urea was 320 mg. per 100 c.cm. He was given grs. 180 of alkali a day by mouth. After three days he passed 10 oz. of urine. The following day diuresis set in and he passed 36 oz. The plasma bicarbonate was 0·0310 molar. On the next day he passed 12 oz. of urine.

In addition to the seven cases described 17 others have been treated similarly, and in a total of 24 cases the method only once failed to establish diuresis.

In this case, a man of 58, there had been complete anuria for four days after injections of salvarsan for tabes dorsalis. Alkalies in drachm doses were given by mouth two-hourly. After a total of grs. 1200 had been given, 7 oz. of neutral urine, containing albumin and a few casts, was passed. Twelve hours later he died suddenly. Post mortem there was marked aortitis and slight degeneration of the renal tubules. Even in this case the urinary secretion was presumably commencing.

In at least 12 of these cases it is a fair assumption that the production of diuresis was very largely the means of saving life.

Table showing the Duration of Suppression and the Plasma Bicarbonate.

Case.	Age in years.	Diagnosis.	Duration of suppression.	Plasma $NaHCO_3$ molar concent.
A	20	Chronic parench. nephritis.	24 hours	0·0235
B	42	Acute nephritis and pregnancy.	3 days	0·0185
C	17½	Sanocrysin poisoning.	3 "	0·022
D	4	Acute on chronic parench. nephritis	3–4 "	0·0163
E	28	Heart failure	2 "	0·0258
F	36	Cellulitis of arm. Old nephritis.	24 hours	0·0267
G	38	Salvarsan poisoning	4 days	0·0265
H	26	Pre-eclampsia	2 "	0·0216
I	16	Chronic pyelonephritis.	3 "	0·026

Significance of Plasma Bicarbonate.

The plasma bicarbonate was definitely below normal in every case where it was estimated. As it increased to a normal level more and more urine was passed. A low plasma bicarbonate does not of itself cause oliguria or anuria, as it is quite common in cases of heart failure, cirrhosis of the liver, Addison's anæmia, and many other diseases with a normal output of urine. There is evidence that an abnormally high plasma bicarbonate leads to renal damage, oliguria, and anuria. Brown and his co-workers [3] have reported cases of toxic nephritis associated with the alkalosis of duodenal obstruction. Fischer [4] and Stolper (unpublished) have produced nephritis in animals by the intravenous injection of alkaline salts, and the writer [5] has described two cases of parenchymatous nephritis treated with alkalies which further illustrate this point. It would seem, therefore, that anuria may be associated with either an abnormally high or an abnormally low plasma bicarbonate. Indeed, it seems doubtful whether anuria can develop or persist when the bicarbonate is normal. In order to prevent anuria, therefore, it is necessary to ensure that the plasma bicarbonate remains normal. Anuria associated with alkalosis is unlikely to be met with except in cases of high intestinal obstruction, persistent vomiting, or over-dosage with alkalies. In such cases the appropriate treatment—in addition to the removal of the cause—consists in giving ammonium chloride by mouth or by rectum in doses sufficient to reduce the plasma bicarbonate to a normal level. Experience has shown [1] that it is unsafe to do this without facilities for the necessary estimations, as over-dosage may lead to a secondary and more persistent anuria. Acute nephritis constitutes an important exception, for in this disorder all the functions of the kidney are for a time in abeyance. Even if the blood bicarbonate is below normal large doses of alkalies may only accumulate in the blood and cause alkalosis. In these cases alkalies should only be given after other measures have proved ineffective, and only then with caution, and, if possible, with blood controls. In none of our cases was blood present in the urine in more than microscopical amounts.

Prevention of Suppression and Anuria.

A decrease of the plasma bicarbonate has been found by the writer, by Cullen, Austin, Kornblum, and Robinson, [6] and by others after prolonged exercise in normal persons, after comparatively mild exercise in nephritics, and after general anæsthesia by chloroform, ether, and nitrous oxide. Gamble, Ross, and Tisdall [7] describe a lowered plasma bicarbonate in starvation. Anuria is especially liable to occur in persons in whom the kidneys are already damaged. It is in such cases that the supervention of any of the above conditions is therefore likely to result in suppression of urine and that alkalies can be used effectively to prevent this complication. The subjects of chronic nephritis of all types, however mild, and persons with damaged kidneys from any cause are bad operative risks from the point of view both of the anæsthetic and of post-operative shock (also associated with an acidosis). The danger consists very largely in post-operative depression of kidney function resulting in suppression of urine, which may or may not terminate fatally. Any remedy, therefore, which will tide them over the emergency will be of considerable value. It is almost impossible to obtain figures which show definitely that the prophylactic use of alkalies effectively prevents suppression, because it is never certain that in a given case such a complication must inevitably ensue. Nevertheless, experience has shown that in a large number of patients with renal damage, mostly chronic nephritis, in whom the plasma bicarbonate was maintained at a normal level by adequate doses of alkalies, the development of infections and inflammatory lesions and the use of general anæsthetics was not attended by any exacerbation of the kidney lesion which could be detected, or by oliguria or anuria, any of which might reasonably have been anticipated.

Experimental evidence is more easily obtained and points to the same conclusion. Kingo Goto [8] showed that uranium nephritis in dogs was much less severe if sodium bicarbonate had previously been given by mouth. MacNider [9] found that dogs with a naturally acquired chronic nephritis developed anuria after being anæsthetised with Grehant's anæsthetic, the principal ingredient of which is chloroform. These dogs did not have an initial acidosis (low bicarbonate), but developed this during the anæsthesia. The anuria was shown to be constantly associated with swelling, vacuolation, and necrosis of the convoluted tubular epithelium, and with the accumulation of fat in the ascending limbs of Henle's loops—the amount of fatty deposition showing a quantitative relationship to the degree of acid intoxication. In a further paper [10] he showed that the prophylactic administration of alkalies

protected the kidneys of these naturally nephropathic dogs against the anæsthetic, so that anuria did not occur. Furthermore, when alkalies were not given and anuria followed the anæsthesia the intravenous administration of caffein citrate, theobromine sodium salicylate, pituitrin, urea, and glucose, failed to induce diuresis. When alkalies had been given before the anæsthetic, although anuria occurred, these same substances produced an increased flow of urine. These experiments suggest that diuretics are not effective unless the plasma bicarbonate is first at a normal level. This would explain their comparative failure in the treatment of chronic nephritis with œdema, a condition in which the plasma bicarbonate is often below normal and in which alkalies are of considerable value.[1 9] MacNider also showed that a 0·9 per cent. solution of sodium chloride is not equally effective in preventing anuria in dogs in similar experiments. Andrews[10] found that the amount of water that it was possible for a dog to excrete after the intravenous injection of glucose was directly proportional to the alkalinity of the blood (plasma bicarbonate). If the carbon dioxide combining power of the blood was below a "critical point" of 45 vols. per cent. diuresis did not occur, as all the water in the body was "fixed" or held relatively firmly by the colloids. Above this level water is more loosely held by the colloids and diuresis occurs. He noted also that above the "critical point"—that is, at the alkaline end of the scale—less water was excreted. These results agree remarkably with those obtained by the writer,[9] who showed that, in some cases of chronic parenchymatous nephritis, diuresis and subsidence of œdema occurred under treatment with large doses of alkalies when the plasma bicarbonate reaches a "critical level." The diminished output of urine when the plasma bicarbonate rises above the normal has also been found by the writer in cases of chronic nephritis and is discussed elsewhere.[1] Liotta[11] found that prolonged administration of sodium salicylate in rabbits caused marked changes in the kidneys, but that when sodium bicarbonate was added to the sodium salicylate these changes were not found. Finally, Weiss[12] showed that the administration of alkalies is by far the most successful method of combating mercuric chloride poisoning in man. The toxic action on the kidneys is largely prevented, so that acute nephritis and suppression of urine are less likely to develop or to prove fatal. There would therefore seem to be abundant evidence, both clinical and experimental, that kidney damage and anuria can be prevented by the prophylactic use of alkalies under a variety of conditions.

Dosage.

In the prevention of anuria by the administration of alkalies a preliminary estimation of the plasma bicarbonate should always be made. In this way only can effective protection be secured. No doubt the routine use of alkalies in these circumstances in amounts sufficient to render the urine alkaline to litmus will prove sufficient in a number of cases, and, given in this way with care, probably little harm would result. Failures, however, are certain with such a haphazard and inadequate procedure. Apart from drawing attention to the possible dangers of empirical dosage, no definite rules can be given, as the amount of alkali needed must be assessed from time to time by the blood findings.

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NOTE ON THE ACTION OF ŒSTRIN ON THE ISOLATED UTERUS

SENSITISED WITH PITUITARY EXTRACT.

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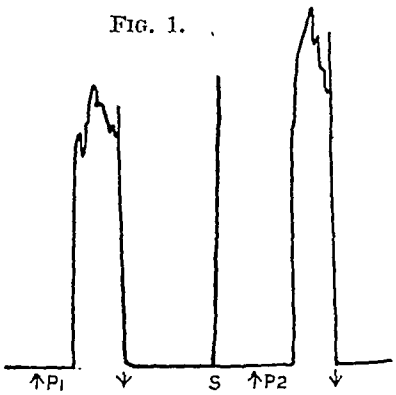
IN a recent paper in THE LANCET Bourne and Burn[1] have described the synergistic action of œstrin and pituitary extract upon the isolated uterus. This synergism is demonstrated by the markedly augmented contraction which pituitary extract evokes when used in the presence of a small dose of water-soluble œstrin.

A series of experiments, somewhat similar but with the sequence of application of drugs reversed, has been in progress here during the last few months. Doses of water-soluble œstrin, large enough to produce a definite uterine contraction have been used, and the contraction evoked by a constant dose of œstrin recorded before and after sensitisation of the uterus with pituitary extract. The results of this series of experiments confirm the findings of Bourne and Burn.

FIG. 1.



Showing increased sensitiveness of the uterus to pituitary extract. At P1 and P2 0·02 units were introduced, at S the drum was stopped and the uterus remained suspended for half an hour in saline +0·01 units.

The water-soluble œstrin used throughout has been prepared by the method of Laqueur, Hart, and de Jongh.[2] The preparations produced characteristic vaginal smear reactions in the ovariectomised rat, as described by Coward and Burn,[3] but no standardisation of the preparations has been attempted. The solutions grew mould on keeping and gradually lost their activity. The dose used throughout was that which was found by trial to be the smallest dose producing a definite uterine contraction.

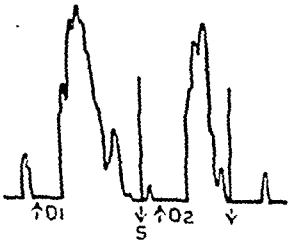
Method.—The uterine horn of the virgin guinea-pig (10 to 12 weeks old) was suspended in 100 c.cm. of Magnus's solution, through which a constant stream of oxygen was passed. The temperature was maintained evenly at 38° C. Drugs under consideration were added to the saline, which was changed after each drug action without altering the other conditions of the experiment. Spontaneous uterine contractions, when present, were almost or completely eliminated by adjusting the weight of the writing lever.

Results.—Control experiments showed (*a*) that the sensitiveness of the uterus to pituitary extract is increased after it has been suspended for half an hour in 100 c.cm. saline containing 0·01 unit of pituitary extract (Fig. 1); (*b*) that the contraction produced by a second dose of œstrin is either similar to, or somewhat smaller than, the contraction caused by the first dose, when the uterus is suspended in saline during an interval of half an hour between the two doses (Fig. 2).

In 30 experiments a contraction was recorded in response to a dose of œstrin. The œstrin was then removed and the uterus sensitised with pituitary extract, as in the control experiments. After washing out the pituitary extract the contraction produced by

a second equal dose of œstrin was recorded and compared with the first. Sixteen of these experiments showed an increase in the œstrin contraction after sensitisation (Fig. 3). Eight experiments gave a negative result, the second contraction being smaller than the first. The remaining six experiments gave no characteristic result as large spontaneous uterine contractions were exhibited and the contractions evoked by drugs were all of equal and presumably maximal size; it was thus impossible to demonstrate an increase of sensitiveness with pituitary extract. In these cases it is probable that the uterus was removed from the animal during œstrus, when, according to Burn and Dale,[4] the muscle is excitable and prone to acquire a large automatic rhythm.

FIG. 2.



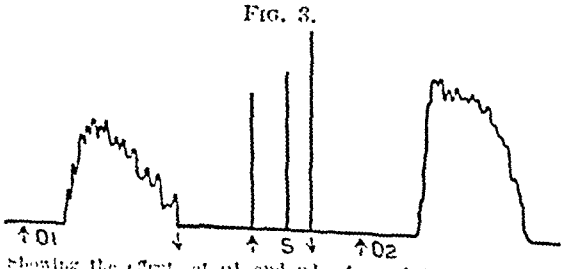
Showing the effect, at o1 and o2, of equal doses of œstrin. At s the drum was stopped and the uterus remained suspended for half an hour in saline between the two doses.

Discussion.

These results indicate that the isolated uterus, sensitised with pituitary extract, is, under certain conditions, rendered more sensitive to the action of œstrin also. Discrepancies due to the varying original sensitiveness of uterine muscle may explain the high proportion of negative results. The phase of the œstral cycle of the animals from which uteri was obtained has not, as yet, been taken into account in these experiments.

The increase in sensitiveness of the uterus to œstrin after pituitary extract is comparable with the synergistic action of the two drugs when used together. Bourne and Burn suggest that the synergistic action of œstrin is an important factor in determining the onset of parturition by enhancing the sensitiveness of the uterus to pituitary extract. These workers regard their hypothesis as an alternative to that of Dixon and Marshall,[5] who describe an increased output of secretion from the posterior lobe of the pituitary gland, occurring in response to an interstitial ovarian

FIG. 3.



Showing the effect, at o1 and o2, of equal doses of œstrin. Between ↑ s ↓ the uterus remained suspended for half an hour in saline and units of pituitary extract.

hormone, and rendering the uterus supersensitive and highly responsive to other forms of stimulation at the close of pregnancy. These two conditions may, however, be considered as coexistent rather than alternative, and the production of a maximal uterine sensitiveness at the onset of parturition may be regarded as the combined rôle of the two ovarian hormones, the development of an augmented response to pituitary secretion producing, concurrently, an augmented response to the presence of œstrin.

References.

1 [illegible] A. W. [illegible] Burn, J. H.: THE LANCET, 1928, ii., [illegible]
2 [illegible] Dale, Henry H.: [illegible] and de Jongh, S. E.: THE LANCET, 1927, i., 113.
3 [illegible] Burn, J. H.: Proc. J. R. Soc. Phys., 1927.
4 [illegible] H.: [illegible] Dale, H. H.: Reports on Biological [illegible] Medical Research Council, London, 1922.
5 [illegible] W. [illegible] Marshall, F. H. A.: [illegible] 1924, lix.

Clinical and Laboratory Notes.

A NOTE ON THE TREATMENT OF RICKETS WITH IRRADIATED ERGOSTEROL AND ULTRA-VIOLET LIGHT.

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IN view of the fact that, in Paisley, we experienced considerable difficulty in inducing mothers to bring their rachitic children regularly three days a week for ultra-violet light treatment, we decided to try a certain number of these children with radiostol (irradiated ergosterol). Accordingly, we selected 42 cases of early, medium, and late rickets, and each child was given one tablet of radiostol daily. The results of treatment were, in most instances, very good indeed. We found that the early and medium cases showed the greatest improvement in the shortest time. Children from 1 year to 14 months old who had not erupted any teeth, and who were neither attempting to walk nor stand, after four weeks' treatment walked unaided, and dentition was well established. Each succeeding month of treatment showed steady improvement, particularly in these two directions. In some instances the general condition of the children improved to some extent but not nearly so markedly as the local condition. The effects of ultra-violet light were in noticeable contrast to the changes seen with radiostol, for after a course of light the most striking improvement was that seen in the patients' general condition. After a short course of treatment the children lost their restlessness, slept well, became happy and contented, and did not cry when handled. Advanced cases of rickets with genu valgum or varum improved slowly under treatment with ultra-violet light.

The conclusions one may draw from the above are as follows: 1. Radiostol is a valuable agent in the treatment of rickets in young children. Though it cannot take the place of ultra-violet light therapy, it is undoubtedly of great service for children who are unable to attend the sunlight clinic regularly. The general condition of such children does not show the same rate of improvement as does the local condition. 2. Rachitic children respond rapidly to treatment by ultra-violet light rays, as is evidenced by the improvement which takes place in their general condition, even after a short course. Rachitic deformities definitely improve under such treatment, though a prolonged course may be necessary to effect a cure.

Edinburgh.

A CASE OF INFECTION OF THE MENINGES BY *BACILLUS LACTIS AEROGENES.*

BY A. DEANE, M.D. ABERD.,
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AND
GEOFFREY SHERA, M.D. CAMB.,
CLINICAL PATHOLOGIST TO THE HOSPITAL.

IT has been stated by Dr. Russell Brain and Dr. F. C. O. Valentine[1] that "general infections, with meningeal involvement, by bacilli of the Friedländer type are occasionally met with, but a mucoid bacillus of these cultural characters (referring to a type of *B. mucosus capsulatus* which formed only acid and no gas in certain sugar media) has not previously been isolated in these laboratories (London Hospital), either from the blood or the spinal fluid." We have therefore thought it worth while to report a case of

[1] THE LANCET, 1925, i., 555.

infection of the meninges by an allied capsulated mucoid bacillus—namely, *Bacillus lactis aerogenes*—in this instance secondary to suppurative cholecystitis.

The patient, Mrs. A., aged 71, was admitted to hospital on May 11th on account of persistent vomiting and pyrexia. A week previously she had had a rigor, with a temperature of 102° F. Since then she had been vomiting frequently and was very constipated.

On admission her temperature was 101°, pulse-rate 132, and respiration-rate 40. She seemed lethargic and very tired, and complained of persistent vomiting and feeling very weak. She was very fat; there was no abdominal pain, tenderness, or rigidity, nor any palpable tumour. There were moist râles at both bases. The next day she was in a state of low delirium, and the following day at noon she had a rigor (temperature 101°) and became deeply comatose and lay curled up on her side in bed with her head forward. Her respirations remained rapid and the pulse-rate 100 to 120; moist râles were more numerous over the chest. Blood-stained pus began to flow from the nose and she died in the afternoon.

Post-mortem examination (G. S.) showed obvious meningitis with green pus over the vertex beneath the pia-arachnoid, *which was raised up in blebs by bacterial gas formation.* The base of the brain and fourth ventricle were also purulent. The middle ear and ethmoidal cells were clear. The nose showed some localised purulent discharge of a chocolate colour. The skull was of abnormal thickness and density. The muscular tissue of the heart was very pale and flabby. There was thickening and incompetence of the mitral valve, and the aorta showed a moderate degree of atheroma. The lungs were congested at the bases. The liver was large, soft, and fatty in texture. The gall-bladder showed one small faceted stone lying in a bag of creamy pus. The spleen was enlarged, diffluent, and septic in type. The kidneys were small and pale; some chronic interstitial changes were evident. The capsule, however, peeled easily.

The cause of death was held to be septic meningitis due (as subsequently ascertained) to infection via the blood stream by *Bacillus lactis aerogenes* and secondary to suppurative cholecystitis. Films from meningeal pus and gall-bladder pus showed many large Gram-negative capsulated bacilli. Some of the forms were very long. The cultural reactions are contrasted in the following table with those of two other bacilli—namely, Brain and Valentine's strain of *B. mucosus capsulatus* and Stitt's description[2] of *B. mucosus capsulatus*.

—	*B. lactis aerogenes.*	Brain and Valentine's organisms.	Stitt's organism.
Type of growth on McConkey's medium	Pink, profuse, and mucoid.		*Colourless*, profuse, and mucoid.
Gram-staining ..	Negative.		
Filaments	Present in films.	?	Present in films.
Motility	Non-motile.		
Gelatin	Not liquefied.		
Serum	Not liquefied.	?	Not liquefied.
Indol formation ..	Negative.	?	Optional (±).
Voges-Proskauer test .	Positive.	?	" "
Animal pathogenicity.	Positive.		
Milk	Acid and clot. in 24 hours.	Acid only.	Acid and clot.
Dextrose	Acid and gas.	" "	Acid and gas.
Lactose	" "	" "	No change.
Mannite	" "	" "	Acid and gas.
Salicin	" "	?	?
Saccharose	" "	?	Acid and gas.
Maltose	" "	?	" ? "
Dulcite	No change.		
Inulin	?	No change.	?

? = not mentioned.

It will thus be seen that these three strains of bacilli differ in certain interesting particulars. Whereas our strain of *B. lactis aerogenes* agrees absolutely with Stitt's, and also Castellani's[3] description of that germ, Brain and Valentine's strain differs from Stitt's description of *B. mucosus capsulatus* in several striking points. First, it does not ferment lactose, and secondly, no gas is formed, nor is milk clotted. These differences are certainly more academic than clinical inasmuch as the bacilli can cause septicæmia and meningitis and are obviously closely allied bacteriologically. The clinical obscurity and insidiousness of the meningeal invasion were a feature of our case.

Unlike bacilli of the Friedländer type, *B. lactis aerogenes* produces gas in lactose, but here again we have a closely allied organism. The justification for publishing this case was the rarity of meningeal infection by *B. lactis aerogenes* group organisms as pointed out by Brain and Valentine in their recent paper, as opposed to the not uncommon type of meningitis associated with Friedländer's bacillus.

[1] Stitt, E. R.: Practical Bacteriology. Blood Work and Animal Parasitology. London: H. K. Lewis. 1927.

[2] Hewlett, E. Tanner: Manual of Bacteriology (Castellani's Classification of the Coliform Bacilli). London: J. and A. Churchill. 1921.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF ANÆSTHETICS.

AT a meeting of this Section on Dec. 7th, Dr. ASHLEY DALY, the President, in the chair, a paper on

PRELIMINARY MEDICATION IN ANÆSTHESIA

was read by Dr. STANLEY ROWBOTHAM.

For the nervous patient, he said, the preliminaries to the actual operation—the journey to the theatre and the taking of the anæsthetic—were fraught with fear and aversion, and he considered that everything possible should be done, within the limits of safety, to blunt sensibility so that the unsettling nervousness would be much less real. The customary gr. ¼ of morphine was not enough. The wind could be a good deal tempered to the shorn lamb by the use of ether per rectum, but the addition of hyoscine he had found to be a distinct advantage. Dr. Rowbotham had been trying to find a way of protecting the nervous system and causing in the patient such a profound sleep before the actual anæsthetisation and while he was still in bed that it would be impossible to arouse him out of it, so that not only would apprehension be abolished but true shock would be diminished. This it was nearly always possible to accomplish with paraldehyde alone, or with hypodermic injections of morphine, heroin, or hyoscine. During the investigation it became clearly evident that combinations of drugs acted more powerfully and for longer periods than did any separate drug of such combination used alone. It was believed by some that this was because the drugs acted on different cells. Chloroform was so greatly reinforced in its action when used in combination with other drugs that the speaker did not think it was safe to employ it following a complete preliminary paraldehyde and morphine narcosis.

For determining dosage Dr. Rowbotham gave four groups of cases:—

1. Children under 7 years of age; under-sized older children; very feeble young subjects; those with low blood pressure; those who had had a heavy blood loss, and who had had a rise of temperature for some days.
2. Normal adults, and children over 7.
3. Very nervous patients; alcoholics; athletes over 25 years of age.
4. Cases of Graves's disease.

He propounded an elaborate table of dosages for each class. In Graves's disease, he said, it was very difficult to narcotise the patients. As operations upon them were nearly always done under local anæsthesia, it was very important to have them absolutely quiet and asleep. For them he used progressive doses, stopping short when the result had been attained. For some days before operation he tested the reaction of the patient to the drugs to be employed. The action of these drugs was more profound in patients with a low blood pressure, those who had had severe hæmorrhage, who had suffered shock, or long-standing sepsis, hence the quantity used must be less.

After giving a detailed account of the actual technique used, Dr. Rowbotham said he did not think paraldehyde alone was contra-indicated for abdominal

operations. The most important contra-indication to this preliminary medication was the necessity of using chloroform as the general anæsthetic. The method he was now advocating had achieved its object very successfully: indeed, in some cases, patients on awaking to full consciousness long after the operation, asked quite innocently when it was likely to take place.

Discussion.

Dr. JOSEPH BLOMFIELD agreed that it was very important that the anæsthetist should make the patient as comfortable and as free from after-effects as Dr. Rowbotham seemed to do with paraldehyde. Not much detail had been given, however, concerning the nature of the cases in which he brought it about. The chief point was the long sleep which ensued after the operation. From the patient's point of view this was doubtless desirable, but there were objections to it. It meant, for instance, that for hours the patient was breathing so feebly that the lungs were inefficiently distended. From this pulmonary congestion serious trouble might arise. And in operations involving the air passages there was the question of blood trickling into places where it was not desired in an insensitive patient. If Dr. Rowbotham would show that he obviated these dangers the method had much to commend it. Avertin seemed to be, in many respects, at least equal to paraldehyde, in some ways even superior. With avertin, however, some anæsthetic had to be used in order to be safe.

Dr. J. W. MAGILL said he had had some marvellously good results with paraldehyde in his private practice. He did not use the method in every case, but found it particularly valuable for nervous children. Much, he thought, depended on the type of nurse on whom one relied to give the rectal injection. It should be warmed before being given; and if olive oil was used it was unnecessary to employ chloretone. Dr. Rowbotham's procedure had the disadvantage that it required a visit to the patient on the previous evening. The method was contra-indicated in cases associated with much sputum, such as bronchiectasis, for such a patient should be active immediately after the operation so as to be able to empty his cavities.

Mr. F. T. EVANS asked whether Dr. Rowbotham got cases of extreme restlessness after using paraldehyde. He had heard of one patient being practically maniacal for some time after the operation, even gr. ¼ morphine failing to quieten him.

Dr. Z. MENNELL expressed a preference for giving an anæsthetic by the upper air passages rather than by rectal injection. He did not think the contention that paraldehyde was quite safe could be maintained. Before the war it had been given intravenously, but two deaths in quick succession had checked that method. Some people had an idiosyncrasy towards the drug, and when once a dose had been given per rectum it was practically irrecoverable. It could not be good for chest operations or for cases in which there was liable to be some hidden hæmorrhage; nor yet for tonsil and adenoid cases, for the children were apt to be asleep while blood was continually trickling into the stomach. A further class of cases in which the method should not be used were those having a high intracranial pressure. The quiet and comparative absence of anxiety on the part of the patient could easily be equally ensured by means of twilight sleep, whose intensity could be modified at will. Some returns were sure to suffer from proctitis after the use of paraldehyde.

Dr. C. H. HOLMES said he had not had experience of Dr. Rowbotham's method, but at present there was a tendency to dispense with morphia, as many surgeons considered that patients were not so well after it. He had talked with Dr. Mennell about the danger of a patient with an abscess concerning paraldehyde.

Dr. HUGH PARTRIDGE contended that Dr. Rowbotham's method was most valuable for children, particularly in the cases which as a rule were difficult to deal with. He had found it very useful during a three-months' stay, and it must be added to the [illegible] staff, as it must be given slowly, otherwise the child might reject it. Paraldehyde, however, should admittedly only be used in selected cases.

Dr. H. A. RICHARDS thought the question at issue was: Should the feelings of the patient be considered or his safety? He had had very little experience of the method, but for nose and throat operations it seemed almost reprehensible to use it. If there were a throat case without bleeding it might be allowable to give paraldehyde, but not when bleeding occurred. He did not feel favourably disposed towards the method.

The PRESIDENT said he did not employ even morphine before the operation, as he had found that some patients had been given it only a short time before the induction of the general anæsthesia was due. The method described should not be used in any case in which bleeding into the larynx was probable. After paraldehyde the condition of patients as they reached the operating theatre was ideal; if only they could be reawakened shortly after the operation matters would be all right. The sooner after operation the patient became conscious and active the better. Sleep could later be induced by a drug if necessary.

Dr. ROWBOTHAM, in reply, agreed it was not possible to use the paraldehyde in hospital as a routine. The timing meant more work for the nursing staff. He had not tried avertin, but he hoped to be able to do so. Most patients under the influence of paraldehyde and morphine got a lower blood pressure. The one or two cases of restlessness which had come into his experience he had attributed to his use of hyoscine. People who lost control under this drug did so also after alcohol. If paraldehyde had been given to a patient and it was found that he was intolerant of it, washing out the rectum would, he thought, recover some of it. The discovery of some persons with an idiosyncrasy towards paraldehyde should not be regarded as a serious argument against its use.

SECTION OF THERAPEUTICS.

AT a meeting of this Section on Dec. 11th the chair was taken by Prof. J. A. GUNN, the President, and a discussion on

PURINES AS DIURETICS

was opened by Prof. E. B. VERNEY. He began by reviewing the work of Bowman and said that the theory which he would adopt was practically that proposed by Bowman in 1842, except that the implicit belief of that authority in the expression of a watery fluid through the glomerular capillaries would be extended to include the explicit belief of Ludwig in the mechanical nature of this transference. It was now almost universally admitted that the function of the glomerulus was to allow the passage of a protein-free fluid having the same composition as an ultra-filtrate of the blood plasma, and that all the water of the urine is primarily eliminated at the glomerulus. To Bowman's belief, that the specific urinary constituents were actively secreted into the watery fluid flushing the lumen of the tubule, would be added Ludwig's conception that the tubule cells concentrated the glomerular filtrate by absorbing water from it. In the passage down the tubule certain useful substances were reabsorbed and others were actively secreted by the tubular cells into the filtrate. It was not known where these processes were carried out, but there was a little evidence that water was reabsorbed lower in the tubule than urea was excreted. The kidney could be regarded as made up of a large number of renal units, each consisting of a vas afferens, a glomerular capillary bed, Bowman's capsule, a vas deferens, the lumen of the tubule, a venule, and a collecting duct. The human kidney was composed of about 5000 of these units. The output of water from any renal unit could theoretically be increased (a) by increased elimination at the glomerulus, and (b) by decreased absorption from the tubule. The total elimination could also be increased by calling into use units which were not previously functioning. A. N. Richards had shown that the

glomeruli of the frog's kidney alternated in function, some opening up while others closed down. The injection of such substances as urea and caffeine into the blood stream increased the number of acting units. This large reserve of the kidney explained its diuretic response to caffeine and urea and the absence of a response when the reserve had been reduced by disease.

Glomerular Diuretics.

The amount of filtrate produced by a single glomerulus could be increased by increasing the filtrate pressure and by increasing the surface or permeability or both. The effective filtrate pressure was the difference between the lateral pressure in the glomerular capillaries and the osmotic pressure of the plasma proteins, and either of these could be varied. Richards had also shown that the capillary loops in any one glomerulus of the frog's kidney were subject to changes in patency, so that the filtration surface might vary extensively. The presence in the blood of urea or glucose, therefore, increased not only the number of active glomeruli, but also the number of active capillary loops in each glomerulus. It was impossible at present to determine the rôles played respectively by the various factors.

W. von Schroeder in 1886, and Phillips and Rose Bradford in 1887, had studied the xanthin bodies, and the former had shown that caffeine usually had no diuretic effect in rabbits under the influence of morphia, but that it acted strongly when chloral was used. He had attributed this result to a stimulation of the vaso-constrictor centre by morphia. If one kidney was denervated under morphia caffeine caused a marked diuresis on that side only. v. Schroeder had therefore concluded that caffeine had a double action on the kidney, an indirect central vaso-constrictor action, and a direct effect on the secreting epithelium. The latter, he had held, was only effective when the former was inhibited, as, for instance, by section of the renal nerves or injection into the blood of some substance like chloral, which protected the vaso-motor centre. The increased output of water was accompanied by an increased output of total salts. Caffeine increased the output of urine in the normal dog very slightly, if at all. v. Schroeder had rejected the glomerular filtrate hypothesis because caffeine produced diuresis when the blood pressure was considerably lowered by chloral, but this conclusion was not justified, as he had not estimated the blood flow. Phillips and Bradford had measured the change in volume of the kidney and the blood pressure in caffeine diuresis and had found that the diuretic effect was not dependent upon the vaso-dilatation or upon the blood pressure. Usually there was considerable expansion at the time of diuresis, but occasionally the diuresis was obtained without this. Changes in the kidney volume did not, however, indicate similar changes in the blood flow, but these results suggested that the rate of urine flow depended on the rate of blood flow. In 1901 Gottlieb and Magnus had obtained similar results, but had accepted v. Schroeder's hypothesis on account of the occasional occurrence of diuresis with increased kidney volume. In 1905 Loewi had concluded that the increased blood flow was the cause of the diuresis. There had been, therefore, no agreement as to whether caffeine could or could not increase the urine without a concomitant increase in blood flow. Richards and Plant in 1915 had shown definitely that caffeine produced increased elimination despite a constant blood flow, and recently Cushny and Lambie had found that caffeine diuresis began before and lasted long after the acceleration of blood flow. They thought that it caused diuresis by reducing the resistance of the glomerular capsule to filtration. It would be premature to deny that the diuretic effect was largely due to an increase in the rate of glomerular filtration arising either from an increase in the capillary pressure, or from an increase in the surface area, or from both. These factors might change without any alteration in the blood flow. The changes in composition of the urine during caffeine diuresis pointed to a glomerular rather than to a tubular mode of action; there was an increased nitrogen and chloride output at the height of the diuresis, varying with the percentage amount present in the urine before the administration of the drug. There was some evidence that caffeine was ineffective in the presence of a glomerular lesion, but effective when the tubular cells were disordered. The dimethylxanthins, theobromine, and theophyllin probably acted in the same way as caffeine. Theophyllin was the most potent of that group.

Such substances as urea and sulphates would presumably act by increasing the molecular concentration of the fluid in the tubules, but it was probable that their effect was partly glomerular in origin.

Discussion.

Dr. E. P. POULTON said he had been disappointed with the clinical action of the caffeine group. He described a case in which the glomeruli had been completely obliterated and the tubules normal, and the patient had had a blood-urea value of 500 mg. per cent., yet she had appeared well until within a few hours of her death. In another case the tubules had been degenerated and the blood-urea normal. He could not reconcile these cases with the statement that urea was excreted by the tubules.

Dr. GEORGE GRAHAM wondered whether the doses in common use were the right ones.

Dr. R. D. LAWRENCE asked whether diuresis had any effect on the renal threshold.

Dr. F. PARKES WEBER mentioned cases of pure parenchymatous nephritis, now called pure nephrosis, in which the output was greatly diminished without a rise in the blood-urea. Diuretics failed completely, and he believed that there was a mechanical blockage, the tubules being so swollen that water could not pass through.

Dr. KINGSTON BARTON recalled a case of auricular fibrillation, resulting from renal disease, in which digitalin had failed to produce diuresis and diuretin had been pressed as well. He remarked on the significance of the degree of alkalinity of the blood for diuretic action.—Dr. A. A. OSMAN said that there was good evidence, both experimental and clinical, that if the blood was either too alkaline or too acid no diuretic would produce diuresis. He suggested that morphine inhibited diuresis by virtue of its depressing effect on the respiratory centre.

The PRESIDENT pointed out that the action of drugs could only be discussed in relation to dosage, and commented on the difficulty of correlating experimental and clinical work, since the administration in the former was usually intravenous and in the latter oral. He asked whether the increased excretion of water would not lead reflexly to local vaso-dilatation. Chloral was a powerful dilator of the peripheral vessels, while morphine slightly contracted them in the rabbit.

Dr. POULTON recalled Brodie's theory that the glomerulus had merely a mechanical pumping action.

Dr. OSMAN pointed out that the diuretics would increase the flow of urine up to a certain degree of acidity or alkalinity of the blood, but that beyond that point oliguria supervened.

Dr. WEBER described pure nephrosis as a functional imitation of what happened in mercuric chloride poisoning.

The PRESIDENT pointed out that the mucous membrane of the large intestine performed an absorbing and an excretory function simultaneously; it was therefore reasonable to postulate a dual function for the kidney tubule.

Dr. BARTON said that cases of slow cirrhosis of the kidney without tubular nephritis might throw some light on urea excretion. The patients had high blood pressure and passed three or four pints daily but were able to live to old age without complaint.

Prof. VERNEY, in reply, agreed that it was impossible to correlate physiological and pathological findings, and thought that the physiologists might have to modify their outlook. Evidence against Brodie's

theory had been provided by Richards's experiment in which he had removed fluid direct from the glomerular capsule and found that it contained no protein, but chloride and glucose in approximately the same proportions as the blood plasma. He had calculated that the volume there was enough to account for the whole quantity secreted. If the rate of urine flow were increased experimentally glycosuria might be produced, presumably because the tubule cells had no time to reabsorb the sugar.

MEDICAL SOCIETY OF LONDON.

AT a meeting of this Society on Dec. 10th the President, Dr. J. WALTER CARR, in the chair, a discussion on

SACRO-ILIAC PAIN

was opened by Dr. WILFRED HARRIS, whose address will be found on p. 1230.

Mr. P. J. VERRALL dealt with the subject from the surgical aspect. In doubtful cases, he said, antero-posterior skiagrams would clinch the diagnosis. Until recently X rays were of little value as a means of diagnosis, as the joint was tortuous; even stereoscopic views often failed to clear up a doubt. He agreed with those who said that if arthritis showed in a joint skiagram it must be of advanced degree. The fact was that one had to rely almost entirely on clinical evidence to arrive at the diagnosis, the radiologist not being able to give much help. Mr. Verrall differed from those who said that all affections of this joint were very rare, though he could not go so far as one speaker in a recent discussion, who declared he had treated 1500 cases of subluxation. Conceptions in regard to sacro-iliac conditions were now on surer ground. Apart from tubercle and strains and subluxation, he agreed with Dr. W. Yeoman[1] that arthritis of the joint was not uncommon. It was supplied by all the nerves near it, and any pain in their distribution could easily be understood by thinking of it as referred. The most severe arthritis in that region was that due to gonococcal disease, which was more common than many supposed; indeed, the sacro-iliac stood high in the list of joints affected by that disease. A strain might be a starting-point of tubercle. There was considerable variation, in different persons, in the long axis of this joint and in the degree of laxity of its ligaments. The joint often became ankylosed in males, seldom in females. The ligaments of the joint took a large part of the superincumbent body-weight, and it had been found that too early weight-bearing after labour was a fertile source of trouble in the joint; so that it was not surprising that a second and better managed puerperium sometimes, as in the case of subinvolution of the uterus from the same cause, cured the trouble. Sometimes the cause of subluxation was the fall of a heavy body on the back while the patient was stooping.

In discussing the diagnosis Mr. Verrall said the symptoms were pain in the back or so-called sciatica, either of which might be due to many causes. If pain was increased by a jar it was suggestive, but this was not a reliable sign. In severe cases the gait of the patient was pathognomonic, especially when he tried to go upstairs. In ordinary arthritis of the hip the joint was stiff and painful in all positions, but the patient with sacro-iliac disability could be observed to seek a comfortable position. The contractions which accompanied a severe case led to an exacerbation of the symptoms. In mild cases there was a tendency to deviate the body to the affected side; in bad cases the deviation was away from the affected side. After the early case showed considerable tenderness, but the advanced case had a flat, [illegible] at lumbar spine and sacrum. Inspection [illegible] a smaller, [illegible] formation and [illegible] with wasting of the glutei and other

[1] The Lancet, [illegible] 1919.

muscles. And in sacro-iliac disease there might be tenderness of the sacro-sciatic notch. Superficial tenderness of the joint and just below it was common and must be carefully distinguished from deep tenderness. A displaced uterus in women or a chronically loaded rectum in either sex were among the causes. In association with Prof. Louise McIlroy he had investigated causes and found that uterine displacements were a less common cause and constipation a more common one than was thought 20 years ago. Compression of the ilia would press two cartilaginous surfaces together, while forcible separation of the anterior superior spines would cause pain if they were inflamed. A positive result of this test he regarded as conclusive.

With regard to treatment, if sacro-iliac subluxation was accepted as a clinical entity, reposition, followed by support, was indicated. If the upper ilium was rotated forward full flexion of legs and spine would reduce the lesion. In other cases in which judgment could be made from the extent of the lordosis—such as that following relaxation due to parturition, in which subluxation was in the reverse direction—reposition was best secured by placing the patient on his face and hyperextending the hip on the affected side, with counter-pressure exerted by the other hand on the opposite side. This reduction should be followed by the wearing of a support or broad band, stretching round the pelvis, with a pad over the affected joint, and the patient should rest in bed for a few days with a lumbar support. Most of the belts used for this condition did not reach low enough; the belt should just clear the seat of the chair when the patient was seated and should be below the great trochanter. In front the belt should encircle the pelvis and bind it firmly together, while it reached a point low enough to hold up the lower abdomen without cutting the thighs when the patient bent forward. Many cases of relaxation could be efficiently dealt with by the more or less permanent wearing of such a belt. In cases of arthritis in which no operation was called for, a belt would relieve the condition while search was made for the cause and treatment was instituted. In sacro-iliac trouble little or no benefit was obtained by local physiotherapeutic measures, such as diathermy and massage.

Operative measures would be directed towards obtaining internal fixation of the joint. Tuberculous sacro-iliac disease was so dangerous to life that severe treatment was often justified; but resection was a severe operation, and should never be undertaken for minor lesions. For the last few years he had been employing a method of grafting which he described in 1921—i.e., placing a graft from the tibia across and between the posterior superior spines, under the erector spinæ muscles, following the principle of the tie-beam to support a house in danger of falling. It had the advantage of being a simple method, and it only required 15 minutes to carry out. And in infected cases (e.g., tuberculous) the operation did not interfere with the infected area unless there was a dorsal abscess or sinus. He had been well satisfied with the results from it when cases were severe enough to require it, which admittedly was fairly seldom.

Dr. JAMES BRAILSFORD (Birmingham) showed a series of skiagrams from 3000 in his collection, to illustrate various accidents, deformities, and diseases of sacro-iliac joint. He said that many of the deformities in this region were not recognised until later in life—i.e., when more strain was put on the region, especially the joint. In some cases there was a separate centre of ossification for the fifth lumbar transverse process.

Dr. C. B. HEALD, who spoke from personal knowledge of the symptoms of sacro-iliac disability, said that an important point was the cat-like cautious way in which the sufferer went about, dreading that he might get into one of the acutely painful postures, particularly in resuming the erect posture after bending. Immediately after the acute pain had gone the legs felt loose and "wobbly" and there was a tendency of the hands.

Dr. H. A. ELLIS said it was always important to examine the condition of the urine in these cases, especially as to its specific gravity. If the urine was of high concentration the pain would not be got rid of until the urine was put right. If the case was one of osteo-arthritis one could be sure of the diagnosis if the urine was of high specific gravity. In both types—high and low gravity urine—there might be an excess of uric acid.

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Dr. C. H. MILLER showed a man, aged 54, with splenomegaly, anæmia, and gout.

The patient gave a history of gout dating back several years, and he had lost weight recently. There was no vomiting and no loss of appetite. In September, 1928, he first noticed pain immediately after dinner, this lasted several days and then began to subside. The family history was good and the man could not remember any serious illness.

The chief points of interest in the case were (1) the general colour, (2) the tophi on the pinnæ, (3) splenomegaly, and (4) enlarged glands in the groins and elsewhere. A blood count on Sept. 20th, 1928, showed hæmoglobin, 22 per cent.; red cells, 1,910,000; and white cells, 10,400. Differential count: polymorphs, 60 per cent.; lymphocytes, 34 per cent.; large mononuclears, 5 per cent.; eosinophils, nil; and mast cells, 1 per cent.

There was slight variation, said Dr. Miller, in the size and shape of the red cells, but no nucleated cells were seen. The Wassermann reaction was negative. Four weeks after admission a further blood estimation showed a slight rise in hæmoglobin and an increase in the number of red cells to 4,060,000. The leucocytes now totalled 8400, with a differential count within normal limits. Stimulated by the results obtained with liver in a case of pernicious anæmia in the neighbouring bed, he had given it a trial here also, but with no advantage. More good seemed to be referable to chlorophyll-carrying agents and atophan.—Dr. R. V. SOLLY had found it impossible to classify the affection from the point of view of the blood picture.—Dr. T. R. WHIPHAM remarked upon the persisting low figure of the hæmoglobin in the second count and also upon the absence of any nucleated red cells as evidence of the blood regeneration which might be presumed to have taken place on comparing the two counts.

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Mr. BRENNAN DYBALL showed a skiagram of a case of anterior spina bifida in the upper dorsal region in a girl aged 15. Nothing abnormal had been noticed until one year ago when the parents remarked that she had become round-shouldered. Examination showed well-marked kyphosis with considerable rigidity in the upper dorsal and cervical regions and with a slight lateral curve convex to the left. The situation of the curve suggested that the case was not one of ordinary scoliosis and the skiagram revealed the true nature.

Dr. R. MICHELMORE read notes and showed tumour removed post mortem from a case of cystic glioma in a man aged 63. The man had first complained of pain in the abdomen, constipation, and tired feeling in September, 1927. A month later there followed left facial paresis of upper motor neuron type and the left pupil was found to be larger than the right. Shortly afterwards difficulty in gait was prominent and mental deterioration showed itself. Examined on Nov. 5th, 1928, the paresis of the face was more marked and the left arm was not raised unless he was urged to do so—there was also bilateral optic neuritis and loss of sphincteric control. The Wassermann reaction was negative. Post mortem a cyst, 3 inches in diameter, was removed from the left temporal region of the brain.

Dr. F. A. ROPER showed cases of bilateral lumbar tumour and encephalitis; Dr. MILLER showed a boy suffering from acute rheumatism; Dr. C. N. LOVELY demonstrated xanthoma multiplex; Dr. ROY CRAIG showed cases of Hodgkin's disease and amyotrophic lateral sclerosis; and Mr. WAYLAND SMITH a case of head injury.

MANCHESTER MEDICAL SOCIETY.

A MEETING of this Society was held on Nov. 7th, with Dr. R. W. MARSDEN, the President, in the chair. A paper on

Convulsions in Children

was read by Dr. C. PAGET LAPAGE, who divided the causes of convulsions into the following three classes:—

1. (*a*) Acute infections such as encephalitis, encephalitis lethargica, and meningitis. (*b*) Mechanical such as birth injury, or hæmorrhage with hemiplegia or diplegia; malformation as porencephaly, microcephaly; cerebral tumour, cortical (may be localised); cerebellar tumour, cerebral abscess, whooping-cough with hæmorrhage, injury.

2. Metabolic and toxic. Nerve endowment, normal or abnormal. (*a*) Rickets with peripheral irritation or additional metabolic upset (gastro-intestinal, bronchial, acute infection). (*b*) Tetany and spasmophilia with calcium deficiency; parathyroid deficiency (may be with rickets); (increased electrical reactions, Chvostek's sign, Trousseau's sign, crowing spasm, carpo-pedal spasm); some acute and some periodical. (*c*) Simple overfeeding, especially if rickets or tetany or nervous diathesis; worms. (*d*) Severe metabolic upsets as uræmia, hypoglycæmia, anaphylaxis, onset of acute illness, &c.

3. Epilepsy. (*a*) Idiopathic, (*b*) accidental. Hereditary endowment of unstable nervous system. Family history of neuropathic disorders. Might be called functional, but usually metabolic or toxic disorders as well. Overstrain and toxins. Nerve-cells irritated. Grand mal; petit mal. Isolated or only in first few years of life. Occasional, with congenital heart; idiopathic of infancy (Thomson); hysteria and hystero-epilepsy.

Dr. Lapage said that if convulsions were correctly placed under these headings prognosis and treatment were very much simplified. The importance of signs of spasmophilia, especially Chvostek's sign, was great, because if they were present there was considerable hope that the cause was spasmophilia and not one of the less tractable conditions. Naturally, if the case was due to spasmophilia the hope of cure was much greater, because spasmophilia was due to

some alteration of metabolism usually amenable to treatment. Continued fits in children were often due to an attack of polio-encephalitis which left an irritable area in the brain. As a result of increasing experience, he felt that more and more cases, which would formerly have been put under the class "epilepsy," should really be placed in the class "organic convulsions caused by some brain lesion." Polio-encephalitis was much commoner than was usually supposed. Attacks simulating petit mal must first of all be distinguished from pyknolepsy, a condition in which the prognosis was quite good, and in which there were very large numbers of small "absences" but never real fits; and also they must be distinguished from attacks like petit mal which occurred in cerebral lesions, especially cerebral or cerebellar tumours. Precursors of Jacksonian epilepsy might be the sudden momentary attacks which caused the child to fall down either backwards or forwards. Cerebral surgery in these cases was often disappointing, but it must always be remembered that hydatid of the brain, even in young children, was not unknown. The possibility of a specific origin must also be remembered and a Wassermann reaction taken.

In the treatment of epilepsy, Dr. Lapage emphasised the value of luminal and the need for careful supervision of diet and daily habits. He reported a case of successful control of fits by a ketonic diet.

LIVERPOOL MEDICAL INSTITUTION.

AT a meeting of this Institution on Nov. 15th Dr. C. O. STALLYBRASS read a paper on

Naturally Acquired Immunity in Human Communities.

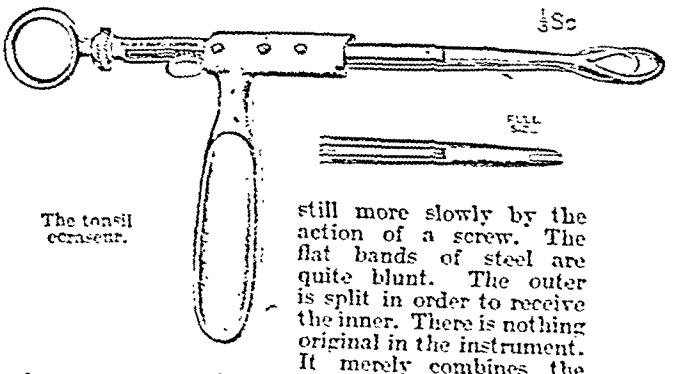
In outlining the history of our knowledge of acquired immunity, he pointed out that deductions from laboratory experiments were not always applicable to man, owing to different portals of infection and the greater longevity among human beings. The effectiveness and the rate at which acquired immunity was lost in different diseases could be gauged by the liability to relapses and second attacks. A very high and permanent immunity was often secured in diseases caused by filterable viruses; in the bacterial diseases it tended to be less; in the protozoal and spirochætal diseases the immunity was often of a very low order —e.g., in relapsing fever and malaria. Much light had been thrown upon the rate of loss of immunity in man by the steady increase both in the numbers of lesions and of fatality in severe small-pox with the lapse of time since vaccination was performed. Infection might produce the typical clinical cases, the abortive cases, the *formes frustes*, and the subinfections. This latter term had been applied by Adami in 1899 to the passage of intestinal organisms during digestion and in inflammatory states of the intestines, into the lymph channels and the portal system. Each of these types of infection might be effective in producing immunity.

The results acquired from the use of the tests for susceptibility to toxins (Bömer, Schick, Dick), and of cutaneous supersensitiveness (Zeller, Pirquet, Lyle Johns), and for the presence of agglutinins (Widal, Weil-Felix) had thrown much light on the acquisition of immunity both in the individual and the herd. They indicated a much wider spread of infection or subinfection than was shown by the statistics of notified diseases. Alongside the visible epidemic of clinically diagnosed cases there was an invisible epidemic of subinfections, revealed only by bacteriology. As to the immunity matters just described, and the invisible epidemic was, in a number of diseases, more effective in the production of herd immunity than was the visible epidemic. Dr. Stallybrass quoted examples from the typhoid, and paratyphoid infections, from [illegible], and from poliomyelitis, in all of which the *formes frustes* and the immunising subinfections occurred with greater or less invisible frequency. In poliomyelitis there was evidence that a most extensive invisible epidemic accompanied the visible outbreak and left behind it a highly immune population. In other diseases, such as small-pox and measles, the subinfections played little or no part in producing herd immunity. The converse aspect of the case was the doctrine stated by Dudley that those who had been longest exposed to an infected environment suffered least when exposed to an epidemic and those who had been least exposed suffered most.

New Inventions.

A TONSIL ECRASEUR.

THE illustration shows an ecraseur with two rings, one of which fits within the other. When the instrument is manipulated into the lumen and put into action these rings press concentrically upon the structures around the tonsil and thereby crush them. The closure is first made by slow pressure of the thumb. When the tonsil is well gripped it is continued



The tonsil ecraseur.

still more slowly by the action of a screw. The flat bands of steel are quite blunt. The outer is split in order to receive the inner. There is nothing original in the instrument. It merely combines the advantages of previous ones; the handle is that of Sluder's guillotine; but any handle can be mounted to it, and Mr. T. B. Jobson uses a very similar instrument with a grip handle. The arrangement of the rings is similar to that in Fahnestock's guillotine. The knife has been replaced by a flat band as in Meding's instrument. I have adapted to the outer ring a valuable modification devised by Sir James Dundas-Grant. The ring in section is not circular but rectangular. This gives a better purchase to the posterior border of the tonsil than does a rounded margin, and many tonsils can thereby be delivered into the ring that would otherwise need dissection. The instrument has now been in use for over two years, and I can say with confidence that it enucleates the tonsils as completely and more cleanly than does any method by dissection. Moreover, it does this without any loss of blood. No sucker is needed and no sponge is used. It is not claimed that this instrument is incapable of improvement. The fact that the terminal portions with the rings are detachable makes it possible to experiment with new rings and minor modifications at a low cost. It is, however, claimed that instruments such as these will make the operation of dissection of tonsils under general anæsthesia a thing of the past except under the rarest of circumstances.

I have to thank Messrs Down Bros. of St. Thomas's-street, S.E., for their unfailing courtesy in the construction of the instrument.

T. B. LAYTON, M.B., M.S. Lond., F.R.C.S. Eng.

ANCOATS HOSPITAL.—A month ago the Board of the Manchester Hospital made their customary annual [illegible] to enable them to add [illegible] to the existing theatres and to enlarge various departments. Up to date they have received £[illegible].

Dr. H. A. ELLIS said it was always important to examine the condition of the urine in these cases, especially as to its specific gravity. If the urine was of high concentration the pain would not be got rid of until the urine was put right. If the case was one of osteo-arthritis one could be sure of the diagnosis if the urine was of high specific gravity. In both types—high and low gravity urine—there might be an excess of uric acid.

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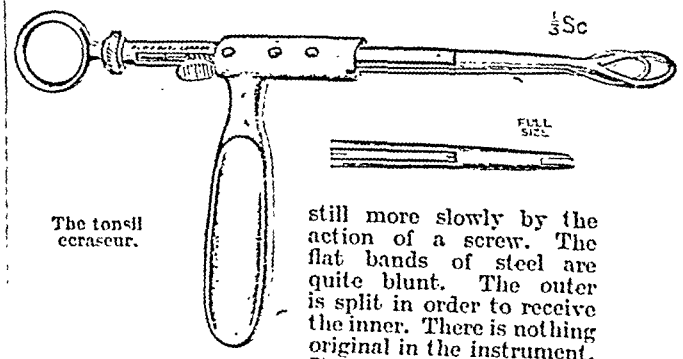

The tonsil ecraseur.

still more slowly by the action of a screw. The flat bands of steel are quite blunt. The outer is split in order to receive the inner. There is nothing original in the instrument. It merely combines the advantages of previous ones; the handle is that of Sluder's guillotine; but any handle can be mounted to it, and Mr. T. B. Jobson uses a very similar instrument with a grip handle. The arrangement of the rings is similar to that in Fahnestock's guillotine. The knife has been replaced by a flat band as in Meding's instrument. I have adapted to the outer ring a valuable modification devised by Sir James Dundas-Grant. The ring in section is not circular but rectangular. This gives a better purchase to the posterior border of the tonsil than does a rounded margin, and many tonsils can thereby be delivered into the ring that would otherwise need dissection. The instrument has now been in use for over two years, and I can say with confidence that it enucleates the tonsils as completely and more cleanly than does any method by dissection. Moreover, it does this without any loss of blood. No sucker is needed and no sponge is used. It is not claimed that this instrument is incapable of improvement. The fact that the terminal portions with the rings are detachable makes it possible to experiment with new rings and minor modifications at a low cost. It is, however, claimed that instruments such as these will make the operation of dissection of tonsils under general anæsthesia a thing of the past except under the rarest of circumstances.

I have to thank Messrs Down Bros. of St. Thomas's-street, S.E., for their unfailing courtesy in the construction of the instrument.

T. B. LAYTON, M.B., M.S. Lond., F.R.C.S. Eng.

ANCOATS HOSPITAL.—A month ago the board of this Manchester hospital made their centenary appeal for £100,000 to enable them to add 100 beds and run additional operating theatres and to enlarge various overcrowded departments. Up to date they have received £20,000.

Reviews and Notices of Books.

ESSENTIALS OF MEDICAL DIAGNOSIS.

By Sir THOMAS HORDER, Bart., K.C.V.O., M.D., F.R.C.P., and A. E. GOW, M.D., F.R.C.P. London: Cassell and Company. 1928. Pp. 682. 16s.

IN this book a successful attempt is made to relay the foundation-stones of the art of diagnosis. Its outlook is consistent and the material put before the reader is admirably condensed. Few, if any, medical facts are omitted; nothing which is not a fact is included; in short, the book deals with diagnosis and not with hypotheses of disease. A notable feature in every section is the physiological epitome that precedes the clinical discussion. The preliminary survey of the central nervous system in Section I., the account of the blood in Section VII., the short description of the normal secretion of bile in Section V., and the introduction to Section VI., which deals with the urinary system, are inimitable. On the clinical side all kinds of examination are dealt with, from history-taking and the simple methods of inspection and palpation, to the more specialised technique of the electrocardiagram, radiography with lipiodol, fractional test-meals, estimation of the blood-urea, van den Bergh's tests, and so forth, these being set out not indeed in great detail but with respect to their exact bearing on diagnosis. Numerous plates, diagrams, charts, and radiograms illustrate the text. Variations in different diseases of the excreta, urine, sputum, and fæces are well described. In the section on the cardiovascular system the authors consider that the position of the apex-beat of the heart should be stated in reference to the nipple line, holding that measurement from the mid-sternal line "is of no value between one case and another, seeing that the criteria vary with age, build, and sex."

This book will appeal to students and practitioners who are anxious to base their medical knowledge upon scientific rather than upon hypothetical considerations. In it they will find a refreshing variety of reading, facts old and new, and a poise which will help them when they are confronted with a case difficult to diagnose.

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The book is a valuable and laborious contribution to a difficult subject, to which, judging from the numerous references to the work of French and German authors, more attention has been paid on the Continent than in this country or in America.

PSYCHOLOGY.

Instinct and Personality. By A. CAMPBELL GARNETT, M.A., Litt.D., University of Adelaide. London: George Allen and Unwin, Ltd. 1928. Pp. 218. 8s. 6d.

ON the basis of the inadequacy of physical energy to explain the mental life of the organism, Dr. Garnett establishes his thesis upon the pre-eminence of mind. The views of the early part of the book are familiar to those who are conversant with the psychology of J. Stout and W. McDougall, and show that instinct and the phenomena of expectation are inexplicable in the absence of mind. Of particular interest to medicine are the chapters on Expectation, where Coué's work receives appreciative comment, and the Explanation of the Unconscious. In this chapter the Freudian conception is very thoroughly analysed. The author concludes that a *mental* unconscious does not exist, that the processes here are entirely physiological and that the phenomena giving rise to the symptoms in neurosis are better explained by suggestion and dissociation. Mr. Garnett argues that the phenomena of dissociation are entirely in favour of the unitary activity of the organism expressing itself through the mind, and that therefore without the concept of personality we possess no system of reference. Teleology is the mainspring of human activity and instincts are the agency for the expression of the total personal trend. In the body-mind relationship we see the work of mind in using physical energy as its instrument. Consciousness becomes not merely "the growing point of life, but the growing point of the universe." A thoughtful book, well worth reading.

Judgement and Reasoning in the Child. By JEAN PIAGET, Professor at the University of Geneva; International Library of Psychology and Scientific Method. London: Kegan Paul, Trench, Trübner and Co. 1928. Pp. 260. 10s. 6d.

No one engaged in education, in mental testing, or in the treatment of the behaviour disorders of childhood can afford to ignore this book, which is a continuation of the author's earlier work, "Language and Thought of the Child." Having established the ego-centric thought processes of the child, Prof. Piaget carries out an extensive research and acute analysis of the logic used by children in facing propositions denoting causality and relationship. To describe the evolution of thought from the purely biological and sociological points of view is to risk casting in the shade half of the real process. Between the ego-centric

life of the child—the realm of pure imagination—and the period of verification lies all the difference between Freud's pleasure principle and the reality principle. The latter is truly the realm of logic. It is the shock of contact with an external world of obstinate fact that calls out in the child the need for verification. The greater part of this book is an application of the Binet-Simon tests to the problem of logical development and calls for careful study; this will be amply repaid by a new insight into the process of the child mind.

The publishers deserve gratitude for the excellent translation of this and the earlier treatise, both of which are rich additions to psychological literature.

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The sections in which a single symptom or sign is discussed in all its bearings are excellent. For example, the differential diagnosis of obesity distinguishes between the forms due to dietetic causes, myxœdema, adrenal cortical tumour, pituitary or pineal dysfunction, the climacteric and Dercum's disease. Other symptoms are treated no less exhaustively. This volume should be of considerable use to the teacher and consultant in solving difficult cases.

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AN ATLAS OF OPHTHALMOSCOPY.

By Dr. O. HAAB, Professor of Ophthalmology, University of Zurich. Translated and edited by W. B. BARKER, F.B.O.A. (Hons.), Lecturer in Applied Optics, College of Technology, Manchester. London: British Optical Association. 1928. Pp. 230.

THE edition of Haab's Atlas best known to English readers is the American one edited by Prof. de Schweinitz, the second edition of which was published in 1909. In the present edition the text is retranslated with some additional matter concerning self-luminous instruments and red-free screens. The plates are reprinted from the original stones. The preface is addressed to opticians—presumably with the suggestion that they should be able to distinguish between diseased and a normal fundus. Although all the plates are good, and the usefulness of some of them has been increased by the addition of illustrations of microscopical sections of eyes suffering from the diseases pictured, several typical conditions both of normal and diseased fundi are omitted—for example, typical coloboma of the choroid and different varieties of physiological discs. On the other hand, one plate illustrates a condition so rare as to be a curiosity—a bubble of air in the vitreous. It is true that to illustrate all the different conditions of the fundus that one is liable to come across in practice would need not a book but a museum. Haab's Atlas is excellent so far as it goes, but we are sure that the distinguished author would be the first to disclaim any idea that it is exhaustive.

A MANUAL OF HYGIENE AND PUBLIC HEALTH.

Second edition. By JAHAR LAL DAS, D.P.H., Officiating Assistant Director of Public Health, Bihar and Orissa. Calcutta: Butterworth and Co. (India), Ltd. 1928. Pp. 661. 6s.

THIS book has been brought up to date, increased in size by 27 pages, and reduced in price from 10s. 6d. to 6s. In its present form it gives quite remarkable value for this modest price. We are glad to note that some of the defects criticised in our review of the first edition have been removed, for instance, an attempt has been made to bring the references to bacterial food-poisoning up to date, and the term "ptomaine poisoning" has been dropped, but the author still uses the obsolete name of "B. suipestifer" in describing the bacterial causes of this disease. It is now universally accepted that the micro-organisms most definitely associated with food poisoning are *B. enteritidis* of Gaertner and *B. aertrycke*. The classification of rats is still imperfect and this is a matter of importance to all those concerned with the hygiene of Eastern countries. The book contains many illustrations, not all of equal merit, and a vast amount of clear and accurate information.

Reports and Analytical Records.

PLASMONA.

(PLASMON, LTD., 66A, FARRINGDON-STREET, LONDON, E.C.4.)

PLASMONA claims to be a blood and nerve food, and to contain the anti-anæmic principle of liver combined with iron phosphatides, cerebrosides, cephalin, protagon, &c., the latter being constituents of the central nerve system, and the vitamin factors A, B, D, and E. The anti-anæmic principle is derived from liver extract, vitamin A and B from liver substance and yeast, vitamin D from cod-liver oil extract, and vitamin E from wheat germ.

Plasmona is a pale, chocolate-coloured powder with a pleasant slightly sweet flavour.

On analysis the following results were obtained:—

Water	5·48 per cent.
Mineral matter	8·02 "
Protein	27·00 "
Sugars	34·60 "
Matter soluble in ether	8·38 "
Polysaccharides, tissue, and indeterminate matter	16·52 "

The mineral matter contained phosphates (P_2O_5) 0·3 per cent., and iron (Fe_2O_3) 0·35 per cent. Fifty-two per cent. of Plasmona is soluble in water and its reaction is neutral.

This is a food of a comprehensively planned character, and obviously contains all the necessary nutritional elements in a highly concentrated form. A portion of the iron and phosphorus is present in organic combination, thus aiding assimilation.

DIAMOND ALUMINIUM WARE.

(THE BRITISH ALUMINIUM CO., LTD., ADELAIDE HOUSE, KING WILLIAM-STREET, LONDON, E.C. 4.)

For many years past the public has been interested in cooking vessels made of aluminium as this metal possesses so many advantages over iron or copper, and to-day they are in wellnigh universal use. From time to time statements have been made that traces of aluminium in foodstuffs are harmful, and the astounding allegation has been made that cancer may be attributable to food prepared in aluminium vessels. The results of an elaborate investigation dealing with the action of foodstuffs on aluminium appeared in our columns about 16 years ago (*THE LANCET*, 1913, i., 54). The conclusion was reached that any suspicion of aluminium communicating poisonous qualities to food in the processes of cooking may safely be dismissed. Suspicion, however, endures, and whilst the harmlessness of metallic aluminium for cooking purposes has never been successfully challenged, we think it may not be out of place to record some fresh work we have carried out on the amount of aluminium taken up by water and meat when boiled and stewed under ordinary cooking conditions.

Water.—Ordinary London water containing about grs. 19 of saline matters per gallon, of which grs. 13 were calcium carbonate, was boiled for one hour in an aluminium kettle, and a similar volume in a glass beaker. The two waters were analysed, the one boiled in the kettle contained grs. 1·28 of aluminium per gallon, the other in glass gr. 0·01 per gallon. The water had thus dissolved grs. 1·27 of aluminium per gallon, or 0·00018 per cent. London water is, however, slightly alkaline, and as the kettle becomes "furred" the amount of aluminium dissolved will tend to become less.

Meat.—Fresh meat was gently boiled in tap water containing a little salt for one hour in an aluminium saucepan and in a glass vessel serving as a control. Analysis showed that no trace of aluminium had been dissolved from the metal vessel. This is a result which might have been anticipated from the work of J. A. N. Friend and R. H. Vallance (*Transactions Chem. Soc.*, 1921, cxxi., 932) and C. K. Tinkler and H. Masters (*Analyst*, 1924, xlix., 30), who found that the colloidal matter which is present in most foods materially lessens the amount of aluminium dissolved.

Although the published data on the toxicity of aluminium are very meagre, the general consensus of opinion appears to be that small quantities are without effect on the living organism. In some recent work of V. C. Myers, J. W. Mull, and D. B. Morrison (*Jour. Biol. Chem.*, 1928, lxxviii., 605), carried out on rats who received 2 mg. of aluminium per rat daily in addition to the stock diet, it was shown that the growth curves over four generations of these animals compared well with those of the controls. The aluminium-fed rats showed a slightly greater initial growth; in other respects the addition of aluminium to the diet was without effect.

It would appear that aluminium vessels if of suitable purity are perfectly safe for cooking purposes, and even if small quantities are conveyed to the water or food, these are without influence on the health of the individual.

the tonsils, and though, when this can be done, tonsillectomy is sometimes strikingly successful, the disease will often persist despite the fact that in the first place it was caused by tonsillar infection. Statistics do not show that the occurrence of rheumatic fever, joint pains, or chorea in children are markedly controlled by tonsillectomy, nor that susceptibility to the infective fevers is diminished by the operation. In a further class, in which symptoms such as enuresis are ascribed to reflex irritation from tonsils and adenoids, the results of operation are still more uncertain. It is only if the individual case is carefully considered, before deciding on tonsillectomy, that the results will be satisfactory. It is not to be expected, of course, that the conditions originally traceable to enlarged tonsils—such as cervical adenitis, rheumatism, or aural disease—will always clear up when the primary focus or port of entry has been removed, and fallacious conclusions are sometimes drawn from an abnormally high incidence of these conditions among persons who have undergone tonsillectomy. This abnormal incidence, where it occurs, may of course be accounted for by the fact that the conditions in question were present before operation and have not been cured. In cervical adenitis there is a further source of error in that a chronic fibrosis is apt to persist after removal of the infecting agent, and statistics which merely mention palpable enlargement of the glands are therefore open to criticism.

THE PROBLEM OF THE UNQUALIFIED ELECTROTHERAPIST.

It is now over a century since the country realised the danger of allowing unqualified and unlicensed persons to handle dangerous drugs; the Apothecaries' Act of 1815 controlled the pharmacist in a way which is undoubtedly to the public interest and which few find too severe or vexatious. Half a century later the doctors were put under a form of discipline which did, however, not extend to penalising those who practised outside the pale. Twenty years passed and the first Dentists Act provided a register and qualification for dental practitioners. Quacks may still practise medicine, for, in the words of Sir WILLIAM PRIESTLEY[1] accoucheur and Member of Parliament, "in England the principles of liberty are carried so far that men insist on their right to . . . being treated medically to their own hurt, if it so pleases them. The only possible limitation is to insist that the public shall be able to distinguish between those who have been educated and registered and those who have not." The abuses of unrestricted medical practice do not appear to be sufficient, in fact, to arouse public anxiety, but the position became so grave with regard to dentistry as to lead the Departmental Committee of 1920 to describe the body of unqualified dentists as a menace to the public health, the registered dental profession, and the more reputable unregistered practitioners. "We are of the opinion," the Committee reported, "that in the interests of the public, dental practice by unqualified persons should be prohibited under penalty, and that nothing short of this is likely to prove effective"—a recommendation [illegible] Act.

A [illegible] situation [illegible] today in [illegible] a wide term including [illegible] diathermy, ultra-violet [illegible] Most of these [illegible]

provided by Nature and have been used empirically for centuries, as Dr. E. P. CUMBERBATCH pointed out recently in his Chadwick Public Lecture. It was, he reminds us, their application by charlatans to all sorts of unsuitable maladies that brought physiotherapy as a whole into discredit at the end of last century. It was also, we believe, the activities of a small pioneer band of non-medical radiographers which in the early days of the present century did so much to bridge the gap between the engineer and inventor on the one hand, and the general practitioner on the other. There can, however, be no doubt that public interest demands some control of these potentially dangerous therapeutic agents, especially in view of the most recent experimental results of their application. The French competent authority proposes to disallow ultra-violet radiation except as part of the hospital services. Experience with dentistry suggests that the proper measure is rather a roll or register of the adequately qualified, protected by a penal clause. The Representative Body of the British Medical Association has passed a resolution affirming its belief in the necessity for a roll; the American Medical Association has already been at work on the problem for three years, and has gone a good deal further. In a recent article[2] Dr. A. DESJARDINS describes the work of the Council of Physical Therapy, which was instituted in 1925 by the American Medical Association to investigate and report. Its first activity was to publish a series of articles on the physiological and therapeutic action of the many different forms of physiotherapy. The Council soon found a grave lack in the medical curriculum of adequate and enlightened instruction in these methods and of suitable teachers, and it is at present coöperating with medical societies in an attempt to arrange undergraduate and post-graduate courses in physical therapy and the essential knowledge of biophysics which underlies it. The Council have also prepared a code of rules to govern the submission and acceptance of devices or methods submitted by manufacturers, and is attempting the Herculean task of reviewing the literature and preparing a scientific nomenclature. A useful report has been made on the transmitting power of various materials alleged to be permeable to ultra-violet rays. A subcommittee is gathering information on physical standards, on protection, and on other questions of fundamental concern to radiologists and is debating the vexed question of standardisation.

These activities provide some useful hints on which the medical profession in this country might proceed even if public interest cannot at present be sufficiently aroused for legislative measures. The number of physiotherapeutic quacks over here falls far short of that across the water, and we must see to it that the situation described by Dr. DESJARDINS does not arise in this country. "Instead of the natural growth resulting from gradual increase in knowledge," he says, "it soon became apparent that physical therapy had fallen into the hands of boosters who had nothing to learn from the realtors of California and Florida, and who were not troubled with petty scruples. The result was that the hapless practitioner of medicine was nearly swamped by the avalanche of incandescent, ultra-violet, and infra-red lamps, high-frequency machines, massage machines without having to be [illegible] and a host of other mysterious devices which were to revolutionise the treatment of disease and produce any known kind of cure [illegible] all but [illegible] The [illegible]

THE RESULTS OF TONSILLECTOMY.

TONSILLECTOMY has long been a common operation and is becoming commoner. At the Hospital for Sick Children, Great Ormond-street, it was done 2886 times in 1920 and 3909 times in 1927—an increase of 34 per cent.—and in the United States removal of tonsils or adenoids is said [1] to account for roughly one-third of all operations among the urban population since 1924. This suggests that on the whole it is successful, and certainly the laryngologist who is careful in selection of his cases will see many gratifying successes with but few failures. Not long ago DONALD PATERSON and G. W. BRAY [2] drew attention in our columns to the gain in weight shown by London children after tonsillectomy. They kept some 500 children under observation before and after operation, and found that before the tonsils were removed nearly one-fifth were losing weight, whilst the remainder were gaining little. In the six months following tonsillectomy, on the other hand, the average gain was 7 lb., which may be compared with an average gain of 2 lb. in normal children of the same age. These observers reach the conclusion that in a properly selected case there is no single operation in children's medicine that is more successful or shows such dramatic results. This opinion will be widely shared, but is by no means universal, and many of the statistical surveys recently attempted do not afford much justification for it. No doubt one of the principal causes of the discrepancy is that patients are not always well selected for the operation. The selection is far from easy, for, on the one hand, the indications for operation are very numerous and in some directions rather indefinite, and, on the other, it is often very hard to determine by examination whether any individual tonsil is unhealthy or not. It is not even a simple matter to estimate accurately the size of a tonsil, for some of them are deeply placed and embedded, whilst others are prominent and superficial. Nor are we sure that an enlarged tonsil is necessarily unhealthy, for sometimes enlargement may be due, as J. H. P. PATON [3] states, to an increase in the number and activity of the germinal follicles—a physiological response, apparently, to some stimulus whose nature is unknown. Sometimes tonsils cause symptoms mechanically by their mere enlargement, and this may make removal advisable; but it is in this group that most of the unnecessary operations fall, especially since routine inspection of large numbers of school-children was started. In doubtful cases examination of the throat with a tongue-depressor is not enough to decide the question of tonsillar sepsis. Redness of the surrounding pillars is a valuable guide, but may arise from other sources, such as septic teeth. Further help may be got by squeezing the tonsil. If definite pus be thus obtained infection of the particular crypt is proved, but a little thin secretion is not conclusive evidence of infection, nor are one or two hard, chalky, or caseous masses in the crypts a proof that toxins are being absorbed from them. It is hard to get reliable bacteriological evidence in these cases, for there are many organisms in the mouth, and a swab taken from the surface of the tonsil will necessarily collect them; it is even difficult to prove that the organisms found in material squeezed from the crypts are pathogenic. Even after removal of the tonsil it is impossible, as R. B. LUMSDEN [4] remarks, to isolate organisms from its substance uncontaminated with those from the interior of the crypts; but the differentiation here is perhaps of little importance, for toxins can doubtless be absorbed from the tonsillar crypts. In the more difficult cases of this class the history is of great importance, and must often be the determining factor in deciding for or against operation. A history of attacks of sore-throat, especially if associated with increased symptoms of toxic absorption, strongly suggests that the tonsils are at fault.

Another cause of the comparatively bad results of tonsillectomy, as shown in group statistics, is that often the tonsils have not been completely removed. The results of treatment cannot fairly be judged from cases in which it has not been properly carried out, and statistics certainly indicate that greater care and skill should be exercised in the performance of an operation which is not so easy as is generally believed. In America J. P. CLARK [5] found tonsil tissue remaining in 41 per cent. of 143 patients who had been operated on three or four years before, while P. S. RHOADS and G. F. DICK [6] found "fairly large" pieces of tonsillar tissue in 73 per cent. of student nurses whose tonsils had been removed. In Scotland, in a large school for the daughters of the well-to-do, PATON found a visible tonsil on one or both sides after previous operation in 54 per cent. of 182 girls. From a statistical consideration of the occurrence of enlarged cervical glands he concludes that the lymphoid tissue regenerated after operation is not infective, but he does not perhaps take into sufficient consideration the possibility that this glandular enlargement is often merely the quiescent result of past infection. On the other hand, RHOADS and DICK find from bacteriological examination that the "stumps" of tonsils removed by a second operation are much more heavily infected than tonsils removed for the first time, and they quote a series of cases which improved strikingly after the removal of tonsillar tissue left by a first operation. All authorities now seem agreed that the tonsils should be removed completely or not at all, but the technique of the operation remains a matter of personal preference and skill. PATERSON and BRAY say that a complete dissection of the tonsil and lingual tonsil must be made, as is the custom at Great Ormond-street, but other authorities show good reason for maintaining that the faucial tonsils can be completely removed with the guillotine by the method of WHILLIS or of SLUDER, and that this is a less severe and equally successful method in suitable cases. Whatever is done, a considerable amount of skill is essential.

The operation is nowadays performed in the treatment of a great variety of conditions. In simple enlargement without symptoms we believe it is seldom necessary and is perhaps done too often. When enlargement of the tonsils and adenoids is associated with disturbance of function of other organs, especially with interference to respiration or to the Eustachian tubes, either mechanically or by spread of inflammation, intervention of some kind is obviously called for, and it is in this class of case that the largest proportion of successes is obtained. There is another group in which tonsillar sepsis produces distant effects on the alimentary tract, the appendix, or the gall-bladder; by absorption of toxins into the blood stream it may cause general debility or the group of symptoms generally called rheumatic. In this group it is harder to prove the culpability of

[1] S. D. Collins and E. Sydenstricker: Quoted by Rhoads and Dick (ref. 6.)
[2] THE LANCET, Nov. 24th, p. 1074.
[3] Quart. Jour. Med., October, 1928, p. 107.
[4] Jour. Laryng., 1928, xliii., 724.
[5] Jour. Amer. Laryng. Assoc., 1913, xxxv., 43.
[6] Ibid., 1928, xci., 1149.

each case can the correct dosage and the best preparation for the individual be decided, and in parkinsonism it should not be difficult for the practitioner to prescribe each drug in turn in increasing doses, and then decide which has given the greatest benefit.

THE STRUCTURE OF THE THYMUS.

THE thymus is commonly described as composed of two distinct tissue elements: lymphocytes or cells like lymphocytes, and epithelial cells which give rise to the familiar Hassall's corpuscles. The question has recently been reinvestigated by Miss Ruth Deanesley[1] at University College, who has studied the destruction of the mouse's thymus by X rays and its regeneration and also what happens in tissue cultures. She comes without any hesitation to the conclusion that there is no epithelium in the thymus. Hassall's corpuscles are formed by the degeneration of blood-vessels and connective tissue; they are not permanent structures but are constantly being absorbed and fresh ones formed. She also describes the formation of ciliated cysts with the same mesodermal origin; they are especially conspicuous during the degeneration following X ray exposure and are, like the corpuscles, only temporary structures which soon autolyse away completely. Such cysts have been seen by various observers in the thymus and have naturally been ascribed to epithelium; pathological histologists meet with cilia or appearances which look like cilia in various strange places, and the possibility that these may be derived from connective tissue or endothelium will be of interest to them.

REACTION TO INSECT BITES.

THE current number of the *University College Hospital Magazine* (1928, xiii., 200) contains an account of some interesting experiments made by Prof. A. E. Boycott which go to show that the ordinary irritable wheal which often follows the bites of midges, mosquitoes, and other insects is an anaphylactic or allergic phenomenon. Persons show no reaction the first time they are bitten by any species of insect, but subsequent bitings may sensitise them and they then respond in the familiar way. They are presumably sensitised to the protein which the insect injects with its saliva. Decisive experiments are obviously hard to make with our native midges, &c., since no one knows exactly what has bitten him in the past. The present experiments were made with the small sandfly *Phlebotomus papatasii*, bred at the London School of Hygiene and Tropical Medicine by Dr. P. A. Buxton, from larvæ sent from Jerusalem by Dr. Oskar Theodor. This insect occurs all round the Mediterranean but does not come nearer England than the neighbourhood of Paris; it may, therefore, be presumed that people who have stayed at home in this country have never been bitten by it. Using throughout the same batch of flies, Prof. Boycott found that four such people gave no reaction at all to their first bitings; in another individual who had been freely exposed to *Phlebotomus* in the East ten years ago, the first application of the insects was followed by immediate wheals. Of the four [illegible] one was doubtfully positive as to his first bite [illegible] time two days after the first biting, and gave a violent reaction to the third biting, which was [illegible] seven days after the first; one gave a large [illegible] on the 10th day; one was [illegible] on the 12th day; one was [illegible] on the third and seventh days [illegible] positive on the 11th and [illegible] days. All [illegible] became sensitive [illegible] as a [illegible] after the first [illegible] [illegible] [illegible]

cyanosis; adrenalin, atropine, and calcium preparations for the spasmodic condition of the bronchioles; and cardiac stimulants such as digitalis and camphor for the cardiac failure (as shown by the enlargement of the liver) are all advisable. Sedatives should be given to calm the child and promote sleep after the attack has been controlled, and in the case quoted these measures quickly restored the child to normal, so that 40 hours after this acute and severe respiratory affection the child was sitting up in bed with only a few adventitious sounds in the lungs to indicate any past disorder.

PREMEDICATION WITH ANÆSTHESIA.

THE discussion at the Anæsthetic Section of the Royal Society of Medicine, following Mr. E. S. Rowbotham's paper on the use of paraldehyde, makes it plain that there is still a good deal of difference of opinion with regard to the advantages of using sedative drugs before the administration of anæsthetics proper. It certainly would appear a priori that multiplication of injected drugs as in Gwathmey's so-called "synergistic" method is undesirable. To begin with, there is little or no definitely ascertained knowledge of the action of these drugs in combination. The very existence of "synergism" has been denied on the grounds of experimental and pharmacological evidence against it, brought forward most cogently by a countryman of Gwathmey's. Obviously the repeated hypodermic and rectal injections are a nuisance unless they procure some very decided advantage. They entail a large amount of trouble for nurse or anæsthetist and a certain amount of inconvenience for the patient. Nevertheless there are many patients for whom it is a great advantage, if not an actual necessity, that the taking of the anæsthetic should be preceded by a powerful sedative of some kind. If that sedative effect can be procured by a single hypodermic or a single rectal injection it appears to us that this is much to be preferred to several injections. One speaker at the meeting to which we have referred above recommended morphine and scopolamine for this purpose, and another urged strongly the use of avertin, which is given rectally, as paraldehyde is. It appears that paraldehyde alone is insufficient generally to procure the desired drowsiness. Avertin is perfectly efficient in this respect. The long sleep that follows the use of efficient premedication is regarded by some of the speakers as a desirable by others as a dangerous consequence. All were agreed on the amount of extra care and trouble that devolves on the nursing staff in institutions where effective premedication is widely employed. There was also a good deal of comment on idiosyncrasy towards some of the drugs used, especially hyoscine, and it was recommended that when possible preliminary trial of a patient's reaction to this drug should be made by the use of minute doses.

THE APPLE.

THE apple as physician has been so abundantly introduced to everyone that medical men cannot but feel an interest in the apple as patient, and the Report for 1927 of the Food Investigation Board might well prove a Christmas best-seller amongst the medical profession, for it devotes many pages to the physiology and pathology of this fruit. An apple consists of sugar, acid, cell-wall material, soluble pectin, minerals, and an organic substance, allied to the carbohydrates, of which the chemical nature is still unknown. The traces of alcohol increase as the fruit rots. Fungus invasion is one of the most serious apple diseases, and its investigation follows lines very familiar to the bacteriologist. It has been found that every individual apple has its characteristic resistance, and that the rate of invasion rises or falls according to the breed of apple and the experimental conditions. The differences in resistance can be correlated with differences in chemical composition of the fruit. Low water content, high acidity, high potash content, and low nitrogen content are associated with high resistance, and the converse is also true. We cannot yet reduce the complicated resistances of the human body to simple chemical terms, but it seems likely that even this will come in time. Another disease of apples is "low temperature internal breakdown"—the hypothyroidism of the vegetable world. This also depends to some extent on the constitution and metabolism of the fruit, but environmental factors play their part. The onset is accelerated by reducing the concentration of oxygen or increasing the amount of carbon dioxide in the storage room. On the other hand, if the storage temperature is kept above the critical range of susceptibility, the reduction of oxygen and increase of carbon dioxide lengthens the life of the apple. Gas storage at about 40° F. is therefore better than cold storage. Long life is related to small size and low respiratory activity and delayed climacteric. The largest apples have the highest respiratory activity and the shortest life—though this is not quite without exceptions, as one tree tested bore large rosy apples which took an exceptionally long time to reach the climacteric peak of respiratory activity. Keeping quality also improves with the heaviness of the soil, and there is a general correlation between the keeping quality and the "available" potash and phosphoric acid in the earth from which the trees spring. A low nitrogen, low acid, and high sucrose content means a good keeper, and apples vary considerably in their composition. It is hoped that this variation may be controllable, as it has been shown to depend to some extent on cultural factors. Apples grown in the warmer parts of England are better keepers, for they have low acid values and high amounts of sucrose. The amount of nitrogen does not seem to depend much on the environment, and research is in hand to find out what internal factors govern it. It is clear that these investigations are of immediate practical value to the fruit-grower and, through him, to the consumer. It is conceivable that they may one day point the way to research on the metabolism of more highly organised forms of life.

PARKINSONISM AND THE ATROPINE GROUP.

SOME months ago a good deal was heard of the value of stramonium in the treatment of chronic encephalitis, and it is interesting to have a report from St. Bartholomew's Hospital on the merits of the drug. Dr. E. A. Carmichael and Dr. F. H. K. Green, of the Medical Professorial Unit, in their clinical and instrumental study of the effects of stramonium, hyoscine, and other alkaloids, find that stramonium was more efficacious than the others in alleviating the symptoms of the bradyphrenic parkinsonian. While they were disappointed with the pills of powdered stramonium leaves recommended by certain French writers, they got uniformly good results with tincture of stramonium. In considering this favourable opinion, it must, however, be borne in mind that it does not agree with the experience of certain other investigators. Thus in a paper on Oculogyric Crises in Chronic Epidemic Encephalitis, published in the current issue of *Brain* (1928, li., 285), Dr. P. K. McCowan and Dr. L. C. Cook discuss the palliative treatment of parkinsonism, and state that after prolonged systematic trials of the atropine group of drugs they find belladonna and stramonium inferior to genoscopolamine and hyoscine by the mouth. They point out that with few exceptions greater benefit accrues from the use of hyoscine hydrobromide by the subcutaneous route, but rightly emphasise the fact that injection should not be resorted to, however, in any individual case unless its greater benefits have first been demonstrated. It is evident that in the atropine group we have a number of drugs definitely useful in the treatment of parkinsonism and its concomitant mental symptoms, but (as so often in medicine) the patient as well as his disease must be considered. Only by trial in

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XV.

THE DETERMINATION OF THE PRESENCE AND SIGNIFICANCE OF REDUCING SUBSTANCES IN URINE.

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II. THE BIOCHEMIST'S RESULTS.

AFTER having ascertained that the patient's urine reduces Benedict's solution, the practitioner is faced with a somewhat difficult problem. He has to determine whether the condition is one of diabetes mellitus on the one hand, or whether it is some harmless form of glycosuria on the other. In the majority of cases he will be helped by the manner in which the patient happened to come under his control. If the patient has lost a great deal of weight and is suffering from the classical symptoms of diabetes mellitus, the duties of the physician will be obvious. By far the most difficult type of case is that in which the urinary reducing substance is discovered more or less by accident during a routine examination, such as for life insurance. The problem here is that of an apparently normal person with no symptoms whatsoever, whose urine is found to reduce Benedict's solution. In this case a fermentation test should be performed according to the method described last week. If a positive result is obtained, there can be no doubt that the reducing substance is glucose. If, however, no fermentation occurs in the urine, then it is far better for the practitioner to send the specimen to a laboratory for further analysis, since it will only be in exceptional circumstances that he will have at hand the necessary materials and apparatus for determining the nature of a reducing substance which is definitely proven not to be glucose.

Let us assume, however, that the urine was fermented by yeast and, therefore, that glucose is present. The possibilities are:—

(1) The patient may be suffering from the early stages of diabetes mellitus and will in time develop all the usual symptoms.

(2) He may have a minor degree of carbohydrate intolerance which is shown by the appearance of glucose in the urine after a meal.

(3) He may be suffering from renal glycosuria.

Tests for Acetone Bodies.

In the first place, the practitioner should test the urine for acetone bodies—that is to say, Gerhardt's and Rothera's tests should be performed.

Gerhardt's test is done by adding 10 per cent. ferric chloride to the urine very slowly. If the concentration of aceto-acetic acid in the urine be 0·07 per cent. or more, the solution will turn a deep red, port-wine colour. This reaction is only given, however, when large quantities of aceto-acetic acid are present and is, therefore, a sign that the patient is in a very bad condition. [illegible] must be drawn to one or two fallacies [illegible] for instance, if the patient [illegible] phenyl drug, then the [illegible] the addition of ferric [illegible] obtained with [illegible] This false reaction can easily be distinguished from the true, since the colour is much darker and of a more violet shade, but if any doubt is felt, then it is a good plan to boil some of the urine. On the addition of ferric chloride there will be a negative reaction if the colour was due to aceto-acetic acid, but if it was due to the presence of drugs, then the reaction will still be positive.

A more satisfactory test for acetone bodies than the above is *Rothera's test*. This is performed by taking half a test-tube of urine and shaking it with about three-quarters the amount of ammonium sulphate crystals until the urine is saturated. A few drops of dilute sodium nitroprusside are added, followed by two or three drops of 10 per cent. ammonia solution, and the whole is well shaken. A positive reaction consists of the development of a deep permanganate colour, varying in intensity with the amount of aceto-acetic acid present.

If these tests are both positive then it is fairly safe to conclude that the patient is suffering from diabetes mellitus, since acetonuria is very rarely present to any marked extent in conjunction with sugar in the urine except in cases of diabetes mellitus.

Glucose Tolerance Tests.

On the other hand, it may be that the Gerhardt and Rothera tests are negative, thus indicating that the condition is either renal glycosuria or possibly one of slight carbohydrate intolerance, as pointed out above. There is, unfortunately, only one sound and reliable method of distinguishing between these types of glycosuria, and that is the performance of a glucose tolerance test upon the patient. This procedure, however, is not very suitable for the practitioner, and the patient should always be sent to a laboratory or institution for the test to be made. The patient is taken in the morning before he has had breakfast and a specimen of blood is collected. Fifty grammes of glucose dissolved in water are administered to the patient and further specimens of blood are taken at half-hourly intervals after the meal for two hours. Each of the five specimens of blood is analysed and the sugar content estimated. The original height, together with the rise and fall of the blood-sugar during the period of the test, is a clear indication of the condition of the patient. The characteristic sign of renal glycosuria is a subnormal sugar content throughout the experiment, while the severe diabetic shows a very high figure which continues to rise during the whole of the two hours. This test is extremely useful for judging the severity of the condition and also for detecting the very early stages in the production of diabetes mellitus. In such a case the patient shows a "lag" curve—that is to say, there is a sugar-storage lag indicated by a very sharp rise in the blood-sugar above the normal limit, but in this type of curve the sugar content falls to normal again within the two hours.

However, if the report from the laboratory or the result of the practitioner's own tests indicate that *lactose* is present in the urine, it is not necessary to take any account of this. Lactosuria is a condition occurring almost solely in pregnancy and lactation and need cause no anxiety. Often one is misled by finding a reducing substance in the urine together with the presence of acetone bodies in a pregnant woman, and in many cases this condition has been treated by strict diabetic measures. Actually the condition is a normal one, since acetone bodies are usually found in the urine during pregnancy, and the reducing substance is lactose. A word of warning must, of course, be given as to the possibility of true diabetes mellitus supervening during pregnancy; the nature of the reducing substance must always be determined.

Should the report from the laboratory indicate the presence of *pentose*, again the practitioner need take no further steps other than to assure the patient that the condition is harmless. Pentosuria is one of the inborn errors of metabolism, remains uninfluenced by any known form of treatment, and so far as we know has no deleterious effect upon the patient's health.

trained and untrained nursing staff required will depend on the types of patient received. According to the memorandum, in the ordinary mixed home there should be, as a general rule, two day nurses and one night nurse for each six patients. At least one nurse must be on night duty whenever there are four or more patients at the home or when any patient is acutely ill. Wherever practicable suitable sitting-room accommodation should be provided for the nurses. Particulars of the standard minimum equipment suggested by the Council are appended, and the list of requirements does not seem to us at all excessive. For example, for each bed the linen provided should be three pairs of sheets, three draw-sheets, six pillow-cases, four bath towels, four face towels; also two sets of blankets, each set consisting of two upper blankets and one under blanket. The provision of stretchers or carrying-chairs is considered desirable; also of proper sluices for the cleansing of bedpans where possible. The Council considers the keeping in nursing homes of domestic animals, such as dogs and cats, to be undesirable.

Undue restriction of visiting hours, inaccessibility of the sister in charge, the routine use of certain favourite purgatives irrespective of the habits of the patient, disinclination to allow the patient to get up until a day or two before he is discharged—all these defects are common enough, and are an indication of inconvenient structure or insufficient staffing, coupled with lack of imagination on the part of the authorities. It is the doctor's business to ascertain whether the patient's convalescence is being retarded by feelings of resentment against the discipline under which he is placed; very often a word explaining the difficulties of administration will serve to put an entirely different complexion on the matter. Perhaps the most important way in which the practitioner can help is to arrange that at each visit he sees the patient, if only for a few minutes, in the absence of either the nurse, sister, or matron. Often, if ample opportunity is given for complaints, none will be made, but the patient will feel that his comfort and welfare are still in the hands of his own trusted doctor, who is guarding his interests, physical and financial, with unremitting attention.

THE MEDICAL DIRECTORY.

THE Medical Directory for 1929 reaches us on Dec. 10th, 1928. It contains evidence of careful revision, the indexing has been improved, certain alterations have been made in headings for the sake of clearness, but the sum-total of change amounts to very little, for, in its eighty-fifth year of issue the publishers of the Directory have little to learn in the way of arrangement or convenience. The only doubt we have is in regard to the binding, which may be good enough for average use, but unfortunately does not survive 12 months of constant office reference. Following the title-page is the usual numerical summary of the medical profession, which shows an increase of 857 entries in 1929 over those of 1928. As usual, the change is distributed unequally over the seven sections, for whereas London (+174), the provinces (+377), Wales (+9) and Abroad (+371) show increase more or less substantial, Scotland (−46), Ireland (−13), and the Services (−15) each show a small decrease. On this page appears a new table giving the numerical progress every decade from 1850 to 1920, in which it is instructive to note that the total number of names in the Directory doubled between 1850 and 1870 and again between 1870 and 1910. The introductory pages preceding the name index have been augmented from 116 to 122, the increase being due almost entirely to the inclusion of a directory of members of the Chartered Society of Massage and Medical Gymnastics. The space devoted to the Incorporation of Certified Masseurs and Masseuses has been proportionately reduced. Of strictly medical information the only addition is the enumeration of the Parliamentary Medical Committee, which, as everyone knows, includes the names of all the Members of Parliament who possess a medical qualification, but, as everyone does not know, also includes the names of four coöpted University representatives—namely, Colonel John Buchan, Sir Martin Conway, Sir Alfred Hopkinson, and Mr. J. J. Withers. The hon. secretary of the Committee is Dr. Drummond Shiels. In the local list for Ireland care has been taken to define the limits of the Free State and Northern Ireland. Finally, the section on the Health Resorts of Great Britain, Ireland, and New Zealand shows signs of careful revision and includes an interesting graph of the temperature of the sea in summer at various marine resorts. The Medical Directory is published by Messrs. J. and A. Churchill at the price of 36s.

AN OFFICE EDITION OF THE MEDICAL AND DENTAL REGISTERS.

IN order to facilitate the work of those who find it essential to know whether a medical practitioner is legally qualified or not—such, for instance, as officials of insurance committees, chemists, and druggists—the General Medical Council publish an office edition of the lists contained in the Medical Register, giving the names and addresses of all registered practitioners. This office edition is bound in paper boards, and issued from the office of the Council, 44, Hallam-street, London, W. 1, at the special rate of 7s. 6d. post free. Similarly the Dental Board publish an office edition of the Dentists Register containing the names and addresses of all registered practitioners and the local list at the price of 4s. post free. We are asked to state that in both cases copies are only issued at this price if they are ordered and paid for prior to Dec. 31st of the year preceding that of publication.

THE ARMY MEDICAL SERVICES.

THE reconstitution of the Army Medical Advisory Board, which is to include four civilian members of the medical profession, is noted on p. 1262, where the new personnel is set out. The Board will be at the disposal of the Secretary of State for War, if he desires to consult them on any question of policy in connexion with the Army Medical Services. Normally the Board will meet three times a year, but the civilian members may arrange additional meetings on giving the necessary notice. It has also been decided to appoint a committee, to be known as the Army Medical Directorate Consultative Committee, which will contain six civilian members of the medical profession who hold instructional or other appointments at university centres or medical schools. This committee will be charged with the duty of advising the Director-General Army Medical Services on the supply of candidates for the R.A.M.C., on post-graduate and other courses, and other administrative or purely professional questions. The civilian members of the Board and of the Committee are admirably representative of medicine, surgery, and physiology; doubtless, machinery exists whereby a pathologist may be coöpted on the last-named body.

Dr. Leonard Gregory Parsons, F.R.C.P., has been elected to the new chair of Infant Hygiene and Diseases of Children in the University of Birmingham.

THE Belfast Public Health Committee has recommended Dr. Charles Samson Thomson, medical officer of health for Deptford, for the post of medical superintendent and officer of health for Belfast.

FOLLOWING the award of the Nobel Prize for Medicine for 1928 to Prof. Charles Nicolle, director of the Pasteur Institute of Tunis, it is announced that the Nobel Prize for Chemistry is to be conferred on Prof. Adolf Windaus, of the Institute of General Chemistry at Göttingen, who has taken a large share in research on the photochemical formation of vitamin D.

Mr. R. J. Johnstone, in a similar memorandum dealing with Ireland, concluded :—

Everyone who has been in close touch with the maternity work of the general practitioner must realise what a boon it will be to him and to his patients when a generation of *properly trained midwives* and *midwifery* nurses has at last replaced his present imperfectly trained assistants. If every nurse were sufficiently well trained to sterilise the patient's vulva effectively, to recognise the distinction between normal and obstructed labour, and to diagnose the termination of the first stage, there would be fewer cases of puerperal sepsis, and the obstetrician's hand would be less often forced into premature and dangerous attempts at delivery.

Sir Leslie Mackenzie contributed a memorandum setting out the position in Scotland. There is, he says, no shortage of supply, nor restriction of the number of midwife candidates. The supply is apt to exceed demand in certain areas, but the Central Midwives Board for Scotland is willing to consider proposals to guarantee a minimum income to such midwives as are unable to earn a living for the time being and whose work the local authority considers to be thoroughly competent. The Board are strongly supporting the recommendations of the Salvesen Committee on the apportioning of the duties of doctor and midwife to render them collaborators and not competitors. "The progressive integration of a real maternity service, both public and private," states Sir Leslie, "demands that the education both of medical students and of midwives shall be comprehensive and exacting. The unsolved problem of puerperal sepsis only emphasises the need for greater stringency in midwifery education."

Warning Notice on Covering: Amendment.

The present Warning Notice relating to covering excludes, together with such people as dressers, midwives, and dispensers, "skilled mechanics." It was suggested that these words would be generally held to apply to the practice of dentistry, yet any skilled dental mechanic who gave treatment, advice, or attendance, even under the immediate personal supervision of a qualified practitioner, would be liable to prosecution under the Dentists Act, 1921. It was therefore resolved :—

That the Committee recommend to the Council that the words "skilled mechanical assistants" be substituted for "skilled mechanics."

The Council adopted the resolution in their sitting on the following Friday.

Ophthalmic Benefit.

Mr. Eason, in a memorandum upon procedure in connexion with ophthalmic benefit, remarked as follows :—

It appears desirable that some warning should be addressed to ophthalmic specialists calling their attention to the fact that, though it may be proper for a general practitioner, who is a specialist on the list, in private conversation with his patients, to recommend himself, among others, as a specialist who might be consulted for the purpose, it is positively improper for him to suggest himself to the attention of any person other than his own patient, and that such conduct if reported to the Council will render him liable to be summoned before the Council on the charge of canvassing for patients.

This warning should be noted carefully by those to whom it is addressed, as the principle underlying it is one that may easily be contravened inadvertently with no intention of committing the offence of canvassing.

[illegible]

MEDICINE AND THE LAW.

The Scale of Medical Fees.

Mr. Justice McCardie's analytical mind takes him deeper than other judges are wont to go into the causes of things. A specialist's claim for fees from a patient gave him an opportunity to review the basis of medical charges last week. Two points received special examination. One was the system under which the medical profession, instead of exhibiting a fixed tariff of standard charges applicable to all cases alike, adjusts its fees to the patient's capacity to pay; the other was the custom of charging on a mileage basis where a specialist visits a patient outside London. As will presently be seen the judge upheld the former practice but did not accept the latter in the circumstances of the particular case.

The general state of the law is fairly clear. There is seldom a definite contract in advance between practitioner and patient, but the law assumes the existence of a contract and makes it an implied term of the contract that the practitioner is to be rewarded for his services. If no definite sum has been stipulated the amount of the reward is what the court thinks reasonable. "I recognise the importance of maintaining an adequate remuneration for the medical profession," said Mr. Justice McCardie; "in order that a man can enter that profession, it requires seven or eight years for him to be qualified and the spending of some thousands of pounds is involved." "A doctor," he added, "has to take expensive rooms and must maintain an adequate social standard; therefore it is impossible to regard the medical profession as other than one entitled to adequate remuneration." The claim before him was that of Dr. J. H. D. Webster, of Chandos-street, Cavendish-square, who sued Miss Muriel Clifford, of Bloomsbury-square, for £103 the unpaid balance of his fees. The defendant, who had previously paid £30 of the bill, contended that the charges were excessive and unreasonable. Dr. Webster gave evidence that on 39 occasions last winter he had treated Miss Clifford for severe sciatica, the treatment including ultra-violet light application. In answer to questions from the judge as to preliminary inquiries made by doctors regarding their patients' social and financial status, he said this patient had been recommended to him by another doctor who, he assumed, had already made some kind of inquiry; he agreed with the judge's suggestion that often, and perhaps normally, the doctor adjusts his fees according to that status; "one always hopes," he added, "to be paid." Asked whether rich patients occasionally objected to pay at a higher rate, he agreed that they sometimes resented being charged more for treatment similar to that in other cases. "You charged Miss Clifford," asked the judge, "as you would charge a prosperous City man?" Dr. Webster said he thought his charge to a prosperous City man might have been higher. He knew Miss Clifford had an address in Jermyn-street, and lived in a flat with two maids; she told him she attended race meetings and lost or won as much as £60 in a day; in view of this he thought she could afford to pay his ordinary charges. When he came to give judgment Mr. Justice McCardie said the difficulties which arose in the case would not have been caused if doctors would tell their patients in clear terms at the beginning of the treatment the scale of fees they intended to charge. He held that Dr. Webster's charges were reasonable and that he was entitled to every penny except a sum of £9 mileage charged on a mileage basis.

The Mileage Basis.

Dr. Webster had on [illegible] travelled from London to Portsmouth to see Miss Clifford at her [illegible] For this he charged £9 mileage, claiming that [illegible] a patient [illegible] travelled. Dr. J. H. Humphrey, consultant X-ray

Special Articles.

GENERAL MEDICAL COUNCIL.

WINTER SESSION, 1928.

EXECUTIVE COMMITTEE.

THE meeting of the Executive Committee which preceded the full winter session of the General Medical Council was exceptionally full of interest to the medical profession at large, and we make no apology for giving a rather lengthy summary of a number of topics then discussed.

International Reciprocity.

The Committee considered the draft of a proposed International Convention on the Treatment of Foreigners, sent to the Council by the Privy Council for their observations. The relevant clause prescribes that nationals of one signatory who are allowed to live in the territory of another shall be treated equally, in law and in fact, with those of the country in which they live, and allowed to carry on all occupations permitted by law to its own nationals. If especial titles or guarantees are required, as in the practice of medicine, nationals of another signatory shall be allowed to exercise their occupation on submitting titles identical with those required of nationals or recognised as equivalent by the signatory concerned. The protocol includes a declaration that it is desirable that arrangements for the recognition of the equivalence of such titles or guarantees should be concluded between countries in which the necessary guarantees of equivalence appear to exist. The Committee resolved that the Privy Council should be informed that the Council regard it as desirable that agreements of this kind should be made, and that, "so far as Great Britain is concerned, these principles have always been acted upon so far as possible."

The absence of such reciprocity has led in the past and may lead again to international reciprocity. An example of unfortunate misunderstanding was provided by another communication from the Privy Council. This concerned a medical missionary with an Edinburgh degree who, finding himself temporarily in Haiphong owing to the trouble in Southern China, had asked the French authorities for permission to practise. The Governor-General had refused, saying that he believed persons were not allowed to practise in England by virtue of French diplomas. Although the Council had replied that the restriction only applied to registration and not to practice, and had suggested that the Governor, considering the exceptional circumstances, might allow this doctor to practise to the same extent that was permitted to French medical men in this country, their request was not granted.

Universities of Bombay, Lucknow, and Madras.

At its meeting the day before the summer session the Committee had decided to continue to recognise the M.B., B.S. of Bombay University provided the Council received, before July 1st, 1929, a satisfactory report from the Indian Government Inspector on the first Final Examination to take place under the new regulations in the academic year 1928–29. In the revised regulations sanctioned by the Government in October, 1928, there is no provision for a Final Examination before April, 1931. The Committee passed a resolution of regret. It would appear that by last summer's resolution the Bombay qualification will cease to be recognised from the summer of next year until the receipt of a favourable report in 1931.

The Committee considered a report by Colonel A. H. Proctor, who had been appointed by the Indian Government to inspect the examinations in Lucknow University on behalf of the Council. Colonel Proctor, who is the Presidency Surgeon in Madras, concluded that the final examination was of a satisfactory University standard, and recommended that the recognition of the M.B., B.S. be continued subject to the production and assessment of the obstetrics and midwifery reports at the examination, and to one other alteration of detail. The practical work in obstetrics is, he says, hindered by the purdah system, but this deficiency should be made up by the building of the new maternity hospital. The medico-legal examination is given great prominence—though Colonel Proctor reported that the questions did not sufficiently test the candidate's knowledge of mental diseases—and the examination in ophthalmic surgery is obligatory, and regarded as extremely important. He spoke very highly of the practical examination in pathology. The students' command of English was sufficiently good for conversation and to appreciate clinical teaching, but did not allow them to do their knowledge full justice in the written papers. Sir Norman Walker's note appended to the report commended Colonel Proctor's careful study of the position.

The University of Madras had reported on the changes and improvements carried out since the recent visit of Sir Norman Walker, and the Committee observed with satisfaction that most of the points which he had criticised had been attended to.

Rangoon University.

Colonel R. A. Needham, inspecting Rangoon University examinations in 1927, had reported unfavourably on the new regulation exempting from the premedical course in chemistry, physics, and biology those students who had passed the intermediate examination in them. The Committee considered a long reply by the University authorities, who maintained that to force these students to study the same subjects for another year would be a waste of time and would extend their course to the prohibitive length of eight years; the University invited inspection of its final examination, the standard of which was second to none in the East. The Committee, while maintaining their own views in regard to the points of difference, suggested the appointment of Colonel Needham to inspect the final examination in March.

Initials in the Register.

In 1924 a registered medical practitioner had applied to have the initial H. substituted in the Register for his middle name. This had been done with an addendum setting out in full the name as it previously stood. The practitioner requested that this addendum be omitted. The Committee directed that he be informed that if he complied with the prescribed requirements the initial H. could be omitted and all reference to his second name would disappear in due course. It has never been customary to enter initials in the Register in place of full names. It has only been done once, when Mr. Charles C. Elliott in 1922 produced evidence that this was his full name, and entered as such on his birth certificate and diplomas.

Education of Medical Students in Obstetrics.

A memorandum by the President of the Council on this subject formed an appendix to the report of the Committee; it set forth the development of the Council's efforts to attain a satisfactory solution, and their present recommendations. Mr. H. L. Eason summed up the position as follows in his memorandum on the training of medical practitioners and midwives in England:—

> In the public interest there should be an ample supply both of medical practitioners and of practising midwives, and the training in obstetrics of both classes should be of the highest possible standard. If in the provision of clinical material for their education their respective interests clash, the solution should be sought in an extension of the field from which this provision can be obtained. And the problem will be simplified by restricting as far as possible the requirements of a certificate of training as a midwife to those who intend to practise as midwives.

the age and intelligence of the group. The records used in the test are made from a series of numbers transmitted by a voice that varies from a loud conversational tone to a barely audible whisper. In the last two years this device has been used increasingly in testing the hearing of children in the public schools. We have now a report[1] by Dr. Frank A. Laurer of the results of a survey of 4419 children in the schools of Syracuse, New York, where the Milbank Foundation is conducting its successful health demonstration. The total number of children found to have impaired hearing was 502, but of these 421 were in the class of "borderline" impairment. Fifty-six suffered a moderate loss of hearing and 25 a severe loss. Two hundred of these students escaped the special examination by an aurist, but the recommendations made in the case of the remaining 302 show clearly to what conditions the defects were due:—

Tonsillectomy ..	187	Medical attention for otorrhœa	33
Removal of wax ..	54	Further observation ..	15
Inflation	13		

It thus appears from this survey that rather more than 10 per cent. of the school-children had subnormal hearing and that about 80 per cent. of these were suffering from defects that were remediable. Such a result seems to justify the routine use of the audiometer.

Deaths from Heart Disease.

An interesting analysis of mortality from diseases of the heart is published in the Vital Statistics Bulletin of the Pennsylvania Department of Health. This State has the largest vital statistics experience of any State health department, since New York City is not included in the figures for New York State, whereas Philadelphia is included in the statistics of Pennsylvania. Here as elsewhere there has been a rising rate from heart diseases from 133·5 per 100,000 in 1906 to 210·6 per 100,000 in 1927. The upward trend has been marked over the whole period of 22 years. In this time the rates for endocarditis and myocarditis and for angina pectoris have doubled. "Other diseases of the heart" also show a marked increase, the only decrease being in pericarditis—from 1·4 to 1·0 per 100,000. Some of the upward trend is explained by the increasing number of older people in the State, but even the standardised rate has increased from 142 to 203. However, when the age specific death-rates are calculated it is found that in the age-groups under 30 the death-rate from heart disease has definitely decreased. The *median* age of death from this cause is now 66 years, or three years older than in 1906, and the most marked increase of rate is in the age-group 80 years and over. It thus appears that the increasing rate is more an evidence of survival to the age of senility than of any increase in the specific causes of heart disease.

The Eyesight of School-children.

At the recent conference in New York of the American National Society for the Prevention of Blindness the responsibility for conserving the sight of the child was placed upon the teacher. Dr. Harry B. Burns, who directs the department of hygiene in the Pittsburgh public schools, reported from 18 years' experience that parents cannot deal adequately with sight conservation. The school, he thinks, is the logical organisation to assume *responsibility for the children's* sight. While the ultimate technical service is that of the oculist, assisted by school physician and nurse, the *immediate responsibility* for vision testing must of necessity devolve upon the class-room teacher. Dr. William H. Holmes (superintendent of instruction, Mount Vernon, N.Y.) urged the consideration of proper lighting facilities in the home; architects, he said, fail to provide the means for correct illumination. Children even in play should be placed where their eyesight can develop normally under proper illumination. Dr. David E. Gillette (Department of School Health, Syracuse) condemned polished desks, and suggested that publishers should avoid glazed paper for school books.

[1] See Amer. Jour. of Public Health, November, 1928.

Medico-political Questions.

The committee on civic policy has reported to the Medical Society of New York County that the practice of fee-splitting is one of the most vexatious and persistent evils with which the society is called upon to deal. While in some instances a manifestation of economic stress, in others it is the product of commercialism and greed. A questionaire on the subject was handed to members along with their voting-papers for new officers, to be deposited unsigned in a separate ballot-box. Information was asked for as to income, as to whether or not the practitioner believed his income to be adversely affected by "dispensaries, pay-clinics, life extension institutes, and health clinics, as at present conducted," as to fee-splitting, as to whether the family doctor receives adequate pay, and as to whether he should be associated in the treatment of a case sent to a hospital by a consultant. The questionaire gives a clue to the burning medico-political problems of the moment.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1927 statistics of nine administrative counties:—

Name of town and estimated (R.-G.) population.	Birth-rate.	Death-rates per 1000 of the population. All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Death-rates per 1000 births. Infant and 1-5 yrs. mortality.	Diarrhœa, &c., under 2 years.	Maternal mortality from childbirth.
Somerset .. .. (401,500)	14·4	12·5	0·71	1·49	2·4	2·1	46/18	3·8	4·0
Staffordshire .. (714,910)	19·3	11·9	0·87	1·12	3·0	1·5	80/—	6·5	3·7
Nottinghamshire (408,100) ..	18·6	11·3	0·81	1·14	2·7	1·3	69/30	3·5	3·8
East Suffolk .. (209,380)	15·8	11·9	0·73	1·48	2·0	1·4	58/24	2·4	4·2
*Cambridgeshire (70,400)	15·0	13·2	1·02	1·49	2·6	2·0	50/17	0·9	5·6
Huntingdonshire (55,880)	16·7	13·5	0·73	1·71	2·5	1·8	61/18	9·6	5·3
Holland .. .. (88,060)	18·8	12·3	0·85	1·57	2·3	1·7	64/29	5·4	2·4
Isle of Ely .. (77,660)	18·6	12·8	0·61	1·74	2·6	1·8	65/20	6·2	3·4
Rutland .. .. (18,060)	14·0	11·2	0·5	1·5	2·2	1·7	63/—	0·0	0·0

* Excluding Cambridge borough, for which see THE LANCET of June 23rd, pp. 1299–1300.
— = No information.

Somerset.

Dr. W. G. Savage expresses satisfaction with the spurt in housing activities during the last few years. Thus the houses built in the urban districts during the last three years have been 581, 974, and 1393, compared with an average of 400 for the previous four years; while the figures for the rural districts are 812, 1217, and 1442, compared with an average of 562 for the previous four years. There has been a need for houses all over the country, but some of the authorities have been active while others have not. Many of the new houses are in towns, but many are in villages and parishes, where no or few houses have been built for generations. As a rule the sites have been well chosen, the spacing adequate with good gardens, and the architectural features harmonious. Dr. Savage gives particulars of the houses built in all the districts under the five schemes of Government

physician to the American Hospital, said the charge was reasonable. In answer to the judge he said he had actually received 200 guineas for going to a patient at Newcastle. After consulting a railway guide, the judge observed that Newcastle was 266 miles from London, to which Dr. Humphreys replied that he must have misread the figures in making his charge. The judge disallowed the item of 30 guineas and substituted the figure of 26; he said that a doctor should make it clear if he is going to charge a special fee of this nature. The upshot of this decision is first that the sum claimed might have been regarded as reasonable if warning had been given; and, secondly, that the court seems to regard it as unreasonable for a specialist to charge a fee of more than four guineas for a special visit to a patient at Eastbourne—a conclusion on which the medical profession will form its own judgment. In so far as the mileage basis is put forward as a matter of custom, it must be remembered that a custom to be legally valid must comply with certain conditions. It must not only not be contrary to the public interest; it must also be definite, well known, and universal. If patients can say that they never heard of such a custom, then it can hardly be called well known; if it is pointed out that a claim is for 30 guineas and that the distance from London to Eastbourne is not exactly 30 miles, the discrepancy is an obstacle to definiteness. It would, therefore, appear better not to insist too much on the basis of custom but to rely on that of reasonableness.

As a matter of fact, as a writer has recently pointed out, the mileage basis is of respectable antiquity. In the eighth volume of "Farington's Diary" there is mention (under the entry for Oct. 25th, 1818) of a Dr. Ainslie's visit from London to a patient at Hastings. "He had 66 guineas, his fee being reckoned at a guinea a mile." It is a pity that this excellent precedent was not quoted to Mr. Justice McCardie who would have appreciated it. Travel, of course, was a different matter a century ago, but then 66 guineas purchased a great deal more than it does to-day. "Farington's Diary," by the by, contains much curious information about medical fees. He quotes a Dr. Baillie as "reckoning to get £10,000 per annum"; Astley Cooper, he believes, makes £22,000 a year, and got a fee of £1000 for operating for stone on "an elderly gentleman from Jamaica."

"Taxing" Doctors' Bills.

The uncertainty of medical fees undoubtedly leads to occasional surprises on the part of the patients where frequent periodical accounts are not rendered. Dwelling upon such occasions, "A Solicitor," writing in the *Birmingham Gazette* of Nov. 28th, makes the ingenious suggestion that doctors' bills should be taxed like those of a solicitor. A lawyer's bill, he explains, goes before an official called a Taxing Master, who disallows such items as he considers unnecessary, improper, or excessive. There is, as he points out, a fixed maximum scale for charges in many matters undertaken by solicitors, and he thinks doctors might be similarly regulated.

The legal and medical professions, in the essentially personal relationship between their members and their clients or patients, have much in common. Doctors will welcome any suggestion from solicitors for the appropriate reward of the services they render. The solicitors are in the enviable position of having had most of their fees substantially raised by order of the Lord Chancellor since the war. But the analogy of the taxation of costs seems imperfect. A successful litigant is, if his opponent is solvent, able to recover his taxed costs. But it is notorious that he is lucky if he has not to pay substantial extras to his legal adviser which are not recoverable. Occasionally the order of the court, or the agreement of the parties, is that the successful litigant gets what are known as "costs as between solicitor and client"; this means that the litigant gets the whole of his expenses paid. On other occasions, however, when he is merely awarded ordinary costs, the taxation of the lawyer's bill merely serves to prove that there is one (rather meagre) standard which the Taxing Master is officially prepared to approve as necessary and proper, and another (more generous) standard on which the solicitor actually charges his client.

The Use of Convicts for Cancer Experiments.

Dr. Norbury, medical officer of health to the Holywell Rural District Council, in a speech in support of the British Empire Cancer Campaign, is reported to have made the suggestion that condemned murderers should have the option of offering themselves for experiment. Research work, he said, is hampered for want of material; hanging a murderer is waste. The idea might not be seriously considered to-day but he predicted that posterity would be willing to give it a trial. It is elsewhere reported that the Cuban Board of National Sanitation has approved a proposal to inoculate convicts under death sentence with cancer germs for purposes of clinical study. The suggestion is apparently coupled with a time limit; if the convict agrees and submits himself, and if he survives 12 years later, what is left of him will then be set at liberty. It would, as has been pointed out, be interesting to see how public opinion reacted to the suggestion. Would it be regarded as a cruel or a humane proposal? And what is meant by "cancer germs"? The medical officers of prisons may find an increasing curiosity on the part of their patients as to the prospects of the artificial introduction of cancer.

It will be remembered that last week our Berlin correspondent reported [1] some medico-legal opinions on a proposal, emanating from Riga, to offer a reprieve to criminals who would submit to inoculation with leprosy bacilli.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Seizure of Quinine.

FOLLOWING the seizure by the Federal Government of quinine worth about £20,000 in New York warehouses, the Federal District Court in that city has entered a consent decree permanently enjoining further violations of the anti-trust laws by the interests that control the world supply of quinine. Production, distribution, and therefore the price of quinine have been absolutely controlled, it is said, by an international syndicate of Dutch, German, French, English, and American manufacturers. In the opinion of the U.S. Department of Commerce the monopoly has been "about as effective as there is anywhere." Henceforth manufacturers of quinine will be restrained from—

1. Imposing restrictions on the re-sale of quinine in the United States.
2. Hindering the shipment in, into, or from the United States of cinchona bark or quinine derivatives.
3. Participating in any arrangement for pooling or division of profits or territory with reference to sales made within the United States.
4. Discriminating between purchasers located within the United States.
5. Selling on condition that the purchaser will not deal with a competitor of the seller.

The Audiometer.

It is now about three years since the Western Electric Company produced the audiometer, a device for the measurement of auditory acuity. Essentially this consists of a gramophone from which the sound is reproduced through a telephone instead of through a horn. It is, of course, possible to attach as many earphones to the apparatus as are required to test a group of individuals all at the same time. Thus a class of, say, 40 school-children can all have their hearing tested in from 10 to 45 minutes according to

[1] THE LANCET, Dec. 8th, p. 1207.

salmonella group and many streptococci. The cattle were dirty and ill-kept, and it was thought the milk might have been infected through this polluted pond. Dr. Holmes reports that the registration of milk producers and vendors in the county is very incomplete.

The appointment of a whole-time rivers inspector has proved of immense benefit in preventing the pollution of rivers and streams. Another hopeful feature is that the various trades are taking a real interest in the purification of wastes. Both the beet-sugar industry and the gas engineers have formed a research committee, and a dyeworks and a colliery have installed apparatus for dealing with their wastes.

The Notts Nursing Federation have appointed 12 new district nurse-midwives for each of whom they received a grant of £30. Other nurses have been appointed to supply the needs of the new colliery villages. The county council have increased the number of health visitors from 20 to 25, but find a difficulty in filling the new appointments, and there were still three vacancies at the end of the year.

East Suffolk.

Dr. Bernard Wood-White reports that the problem of the pollution of the river Gipping by the waste of the Stowmarket silk works is still unsolved, and that attention is being drawn to the condition of the Stour, owing to the intention to use it for water-supply. During the first six months of the operation of the Housing (Rural Workers) Act 35 applications were received. Two were refused, and 19 grants were promised, totalling £788. With regard to "ribbon" building, Dr. Wood-White thinks that in a short time the traffic on the main roads will increase to such an extent that it will become the height of folly to build houses alongside them. The arterial roads should proceed as far as possible through uninhabited country, and avoid towns and villages for the sake of the quiet of the inhabitants and for the convenience of the traffic.

During 1927 six samples of milk examined at the county laboratory were found to contain tubercle bacilli. Four were complaints from Lowestoft, and two were from a group of 33 routine samples taken by arrangement with the district councils. In three cases tuberculous cows were found and slaughtered, but in the other three the biological tests could not be carried out owing to the shortage of guinea-pigs. There are no licences in the county as yet for Certified or Grade A (T.T.) milk.

Dr. Wood-White has extended his investigation of the economic loss caused by various diseases. During 1927 the following deaths occurred: heart disease, 385; cancer, 310; bronchitis, 172; tuberculosis, 153; influenza, 130. When the age value of the lives lost is considered, the comparative damage to the community from these deaths was in the following order—tuberculosis, 2827; cancer, 2702; heart disease, 1839; influenza, 1147; and bronchitis, 431. Dr. Wood-White also finds that the East Suffolk deaths from heart disease occur at higher ages than in the county boroughs and the rest of England and Wales, and he gives reasons for his opinion that acute rheumatism is less common in East Suffolk than in the rest of the country.

Cambridgeshire.

Dr. Frank Robinson reports that the need for a maternity hospital will be somewhat relieved by the opening of an eight-bed ward at Addenbrooke's Hospital, but it is hoped that ultimately a maternity home will be provided in the grounds of the hospital, supported by grants from both town and county, at which an efficient antenatal clinic will be established. The county council granted three nursing scholarships of £75 each during the year, and since 1913 it has, in this way, facilitated the training of 37 nurse-midwives. The county council also subsidises the County Nursing Association, and there are now only 26 rural parishes, with a population of 7700, without a nursing service. The first clean milk competition was held in the six rural districts which constitute the administrative county outside the borough of Cambridge. Twenty-one herds, containing 596 cows, were entered. Of the 134 samples taken, 48 per cent. reached the standard of Certified and 68 per cent. the standard of Grade A milk. The judge commented that the competition showed that it was possible to train old milkers in modern methods. It is now becoming feasible to close unfit houses. Use was made of the Housing (Rural Workers) Act for two cottages only, and the county council sanctioned loans to the extent of £4650 under the Small Dwellings Act.

Huntingdonshire.

Dr. C. B. Moss-Blundell would like to see more stringent measures taken to deal with tramps, seeing that, in addition to damaging property by fires and pilfering, they act as spreaders of disease. The needs of the tuberculosis dispensary include a branch in the north of the county and a more systematical examination of contacts. The total deaths attributed to tuberculosis were 41, and the contacts examined numbered 67, of whom 20 were tuberculous, 10 doubtful, and 37 non-tuberculous. There were four notifications of, and four deaths from, encephalitis lethargica.

Holland.

Dr. H. C. Jennings's report has as a frontispiece a photograph of the Clean Milk Exhibit shown by the health department at the County Agricultural Show in June. Additions to the activities of the health department include a new branch tuberculosis dispensary at Donington, an infant welfare centre at Crowland, and the establishment of a county laboratory. There were six notifications of encephalitis lethargica, and five ended fatally. The notification of tuberculosis is unsatisfactorily carried out. The Holland Sanatorium (24 beds) is chiefly used for advanced cases, but the council also provides treatment in out-county sanatoriums (20 beds). In this county, where distances from the nearest medical practitioner may be great, the problem of the handy woman presents special difficulties. The solution lies, says Dr. Jennings, in forming many nursing associations with resident midwives. The necessary equipment has not yet been provided for the conduct of antenatal work at the welfare centres. There were only three applications under the Housing (Rural Workers) Act, of which two were withdrawn and one refused. There is a considerable amount of poor-law hospital accommodation in the county available for use on a voluntary basis.

Isle of Ely.

Dr. J. Pixton Walker reports that the new health offices were opened in October. He states that there is great difficulty in finding institutions willing to take mentally deficient cases from his area. There is a proposition for the purchase of a hall for the county of Norfolk for this purpose, and Dr. Walker hopes that his county will associate itself with this scheme.

Rutland.

Dr. Christopher Rolleston welcomes the Housing (Rural Workers) Act, 1926, as one of the most beneficent measures ever adopted. During the first six months of its operation four houses have been converted into satisfactory dwellings, but the benefits of the Act are as yet insufficiently known. Veterinary inspection of cattle is now in active operation in Rutland. Of the total deaths one-half were of persons over 65, and one-quarter of persons over 75. Dr. Rolleston points out that a large portion of the apparent increase in heart disease is due to the greater age at death and the fashion of certifying from "heart disease" rather than from "old age." He thinks also that the decline in the mortality from cancer of the tongue is partly due to the decrease in syphilis and partly to better attention being given to the teeth. He quotes approvingly the recent resolution of the British Medical Association with regard to periodical medical and dental examination. The nursing service has been extended, and there are now only three villages lacking it. Rutland comes

out well for the high proportion of contacts examined at the tuberculosis dispensary, and also for efficient ascertainment of mentally defective persons.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED DEC. 1ST, 1928.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 189 (last week 199); scarlet fever, 2777; diphtheria, 1420; enteric fever, 34; pneumonia, 1099; puerperal fever, 49; puerperal pyrexia, 126; cerebro-spinal fever, 12; acute poliomyelitis, 6; acute polio-encephalitis, 1; encephalitis lethargica, 22; dysentery, 6; ophthalmia neonatorum, 76. No case of cholera, plague, or typhus fever was notified during the week.

The cases of small-pox were notified in the following 16 counties:—London, 4; Chester, 4; Derby, 19; Durham, 33; Essex, 5; Lancaster, 40; Leicester, 2; Northampton, 1; Northumberland, 14; Nottingham, 8; Soke of Peterborough, 3; Stafford, 8; Warwick, 1; Yorks, West Riding, 24; Glamorgan, 13; Monmouth, 10.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Dec. 4th-5th was as follows:—Small-pox, under treatment 20, under observation 2; scarlet fever, 2548; diphtheria, 2096; enteric fever, 16; measles, 65; whooping-cough, 352; puerperal fever, 14 (plus 8 babies); encephalitis lethargica, 75; poliomyelitis, 4; "other diseases," 12. At St. Margaret's Hospital there were 8 babies (plus 3 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 3 (0) from enteric fever, 19 (0) from measles, 6 (1) from scarlet fever, 31 (10) from whooping-cough, 34 (5) from diphtheria, 55 (12) from diarrhœa and enteritis under two years, and 56 (11) from influenza. The figures in parentheses are those for London itself.

The fatal cases of enteric fever outside London were reported from Reading, Birmingham, and Manchester. Newcastle-on-Tyne reported 6 fatal cases of measles, Liverpool 6, and Stockton-on-Tees 2. Fatal cases of whooping-cough were reported—3 each from Liverpool and Manchester. Liverpool also reported 3 deaths from diphtheria. Diarrhœa claimed 5 deaths each at Liverpool and Manchester, 4 at Middlesbrough, 3 each at Leeds and Hull. Deaths from influenza did not exceed 2 anywhere except Manchester 3 (and Glasgow 5).

The number of stillbirths registered during the week in the great towns was 296 (corresponding to a rate of 43 per thousand births), including 47 in London.

The Services.

THE ARMY MEDICAL ADVISORY BOARD AND THE ARMY MEDICAL DIRECTORATE CONSULTATIVE COMMITTEE.

It has been decided to reconstitute the Army Medical Advisory Board, with the Director-General, Army Medical Services, as President, the members of the Board consisting of four civilian members of the medical profession and the President of the Medical Board, India Office (ex officio), when matters concerning India are under discussion. The secretary will be the deputy assistant Director-General of A.M.D. 1. The following are the terms of reference: To advise the Secretary of State for War on any question of policy, in connexion with Army Medical Services, on which he may desire to consult them. The four civilian members will be appointed by the Secretary of State. In the event of a vacancy occurring, a fresh appointment will be made by the Secretary of State on the recommendation of the remaining members of the Board. The ordinary meetings of the Board will be presided over by a chairman—appointed by the Secretary of State from among the civilian members of the Board and nominated by the members in consultation with the D.G.A.M.S. The D.G.A.M.S., as President, may attend any meeting of the Board if, on account of the special problems to be considered, or for any other reason, he desires to do so, and will then take the chair. The Board will meet three times a year, but the civilian members may arrange additional meetings on notifying the D.G.A.M.S. through the Chairman. After each meeting the conclusions of the Board will be reported to the D.G.A.M.S. and, after further consultation if necessary, by him to the Secretary of State. The Secretary of State will see all or any of the civilian members of the Board whenever he desires to do so, and the Board as a whole will have the right, after informing the D.G.A.M.S., of access to the Secretary of State.

The following have been appointed to the Board: President: Lieut.-General Sir Matthew H. G. Fell. Chairman: Hon. Major-General Sir Berkeley G. A. Moynihan, Bt. Members: Hon. Major-General Lord Dawson of Penn, Hon. Major-General Sir Cuthbert Wallace, Prof. D. P. D. Wilkie. Secretary: Major C. M. Drew, R.A.M.C.

It has been decided to appoint an ARMY MEDICAL DIRECTORATE CONSULTATIVE COMMITTEE constituted as follows: The Director-General, Army Medical Services, chairman; the Deputy Director-General, Army Medical Services, vice-chairman; six civilian members of the medical profession who hold instructional or other appointments at University centres or medical schools, and one civilian member of the Chemical Warfare Committee as members. The Secretary will be the Deputy Assistant Director-General of A.M.D.1. The following are the terms of reference: To advise the Director-General, Army Medical Services, as to: (*a*) The supply of candidates for the Regular R.A.M.C. and its reserves. (*b*) Post-graduate and other professional courses of instruction for R.A.M.C. officers. (*c*) Such administrative or professional questions as may from time to time be referred to it. The civilian members will be appointed by the Secretary of State, on the nomination of the D.G.A.M.S. They will normally serve for three years. Full meetings of the Committee will be held twice yearly, or as often as may be required, at the War Office. Other meetings may be held elsewhere as required. The chairman or vice-chairman and two members of the Committee will form a quorum for the transaction of business. The Secretary of State has approved the following appointments to the Committee: Chairman: Lieut.-General Sir Matthew H. G. Fell. Vice-chairman: Major-General H. B. Fawcus. Members: Prof. J. Barcroft, Lieut.-Colonel Sir Robert A. Bolam, Colonel Sir E. Farquhar Buzzard, Colonel T. R. Elliott, Captain J. Fraser, Colonel G. E. Gask, and Colonel A. E. Webb Johnson. Secretary: Major C. M. Drew.

ROYAL NAVAL MEDICAL SERVICE.

The following appointments are notified:—Surg. Comdrs.: H. D. Drennan to *Victory*, for Portsmouth Dockyard; C. Ross to *Vivid*, for R.N. Barracks, Devonport; F. J. Gowans to *Victory*, for Haslar Hosp.; J. A. Maxwell to *London*; A. B. Clark to *Revenge*; H. E. R. Stephens to *Pembroke*, for R.M. Infirmary, Deal; H. R. B. Hull to *Victory*, for R.N. Hospl., Haslar; R. H. McGiffin to *Nelson*; T. R. L. Jones to *Emperor of India*; and J. G. Danson to *President*, for three months' post-graduate course. Surg. Lts.: A. E. Kingston to *Marlborough*; T. G. B. Drawford to *Dryad*; T. L. Cleave to *Argus*; L. J. Corbett to *Queen Elizabeth*; A. S. Nicol to *Defiance*; J. K. G. Way to *Dartmouth*; W. J. Doody to *Birmingham*; and J. Mitchell to *Cleopatra*.

ROYAL ARMY MEDICAL CORPS.

Col. G. J. A. Ormsby, late R.A.M.C., retires on retd. pay.

Lt.-Col. FitzG. G. Fitzgerald, from R.A.M.C., to be Col., vice Col. G. J. A. Ormsby, to retd. pay.

The undermentioned Lt.-Cols. retire on retd. pay: Bt. Cols. A. E. Hamerton and J. Powell (and is granted the rank of Col.), and W. Bennett (and is granted the rank of Col.).

Maj. P. Power to be Lt.-Col., vice Lt.-Col. FitzG. G. Fitzgerald, promoted.

ARMY RESERVE OF OFFICERS.

Lt.-Col. A. B. Smallman, having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

Capt. G. Marshall, from Supp. Res. of Off., R.A.M.C., to be Capt.

Lt. W. F. Roper from Reg. Army Res. of Off., R.A., to be Lt., retaining his present seniority.

TERRITORIAL ARMY.

Col. J. H. Hunter resigns his comm. and retains his rank with permission to wear the prescribed uniform.

Lt.-Col. (Bt. Col.) A. R. Moodie, from Gen. List, R.A.M.C., T.A., to be Col., and to be A.D.M.S. 51st (Highland) Div.

Lt. R. McD. Cairns to be Capt.

Supernumerary for service with O.T.C.: Lt.-Col. F. A. E. Crew, Univ. Contgt., Sen. Div., O.T.C., to be Bt. Col.

INDIAN MEDICAL SERVICE.

To be Capt.: J. Smith.

To be Lts.: Makhan Singh and Marinho De Azavedo.

To be Second Lt.: J. Mackie.

Correspondence.

"Audi alteram partem."

THE MODE OF EXPRESSING THE DIFFERENTIAL LEUCOCYTE COUNT.

To the Editor of THE LANCET.

SIR,—I have long marvelled that so many pathologists are content to report their differential leucocyte counts merely in percentage form, and that clinicians are willing to put up with this. For nearly 30 years I have been accustomed to impress upon the students at St. Bartholomew's Hospital that, if they would understand the meaning of such counts, they must apply the percentage figures to the total count, and learn to think in terms of absolute figures of each kind of leucocyte per c.mm. of blood.

The recipient of a mere percentage count must, even if unconsciously, go through some such mental process before he can grasp the significance of the figures. When he is told that a patient has 60 per cent. of lymphocytes, he must necessarily pause and think for a few moments whether the increase is real or only apparent. Whereas if he is told that there are 2000 or 6000 lymphocytes per c.mm., he should apprehend the facts at a glance. In ordinary life we should not tolerate this roundabout mode of stating facts.

Not long ago you published in your series on the Clinical Interpretation of Aids to Diagnosis some excellent articles by Dr. S. C. Dyke on the interpretation of blood counts, and it is the article in your issue of Nov. 10th last which has moved me to these remarks, because it contains no reference to the direct way of expressing results. Dr. Dyke is very well aware of the fallacies which may lie on the face of a mere percentage statement; he felt obliged to draw attention to them here and there, and to explain that "relative lymphocytosis" practically always meant polymorphonuclear leucopenia. Yet it never seems to have occurred to him to tell his readers that by a plain statement of actual numbers all misconceptions could be avoided. When that is done we shall cease to hear the fatuous term "relative lymphocytosis"—fatuous because in so far as it is really relative it is not lymphocytosis. Dr. Dyke will then tell us, correctly, that eosinophilia means an increase in the total circulating leucocytes, not that it is an increase in their percentage number. The clinician himself will find it less trouble, in the long run, to learn once for all the normal numbers of each kind of leucocyte per c.mm., than to do sums in his head whenever he receives a percentage statement.

I am, Sir, yours faithfully,

Highgate, Dec. 8th, 1928. F. W. ANDREWES.

A SIMPLE MECHANICAL AID TO LABOURED RESPIRATION.

To the Editor of THE LANCET.

SIR,—I should like to call the attention of my colleagues to a simple expedient for easing respiration in cases of dyspnœa. Anyone who has tried to breathe deeply when lying on his back will have noticed a certain inhibition at the end of inspiratory effort. If now the experimenter takes a towel folded to about a handbreadth, or any similar broad soft girdle, lays it against the small of his back, brings the two free ends forwards, and draws upon them so as to give support to the back, he will notice that his breathing becomes easier and the difficulty at the end of inspiration is removed. Obviously this result is likely to be better when the manipulation is made by a third person. The simple manœuvre produces some alteration in the circulation with a certain definite relief to the right heart. It should find its use in many of the cases of respiratory or circulatory disturbance, whether of functional and organic nature, which are seen in private work. The small of the back may also be supported by some arrangement in the bed, so that the effect can be kept up for a longer time, but its continuous application will only seldom be necessary. Intermittence several times a day seems to be advisable, and this should be gradual, not sudden. In pulmonary cases the pull on the side of the affected lung should be carefully controlled, especially if there is pleural effusion. That this owes its value not solely to suggestion has been shown by myself and my colleagues in a series of cases, but what exactly is the mechanism must be determined by exact experiment.

I am, Sir, yours faithfully,

Vienna, Dec. 3rd, 1928. BERTHOLD BEER.

ULTRA-VIOLET LIGHT AND CANCER.

To the Editor of THE LANCET.

SIR,—In reply to the letter of Dr. M. Weinbren in your issue of Dec. 8th:—

1. The literature cited from Unna (1896) to Colquhoun (1927) shows that clinicians have with increasing precision incriminated first exposure to the weather, then prolonged exposure to sunlight, and finally therapeutic exposure to the mercury-vapour lamp in the production of certain precancerous and cancerous lesions.

2. A mercury-vapour lamp was not used to prove the effect of sunlight.

3. There was no relation between ulceration and the subsequent growth. The growth occurred on skin which either appeared normal or atrophic.

4. There was evidence that a slight degree of tolerance was acquired.

5 and 6. Experiments are already being carried out on the lines suggested.

7 and 8. Experiments with a thermophile show that under the experimental conditions used the rise in temperature is not greater than 5° C. Exposure of mice to a considerably higher temperature than this for eight months has up to the present failed to induce cancer.—I am, Sir, yours faithfully,

G. M. FINDLAY.

Imperial Cancer Research Fund, Queen-square, W.C., Dec. 8th, 1928.

CHRONIC SPASMODIC AFFECTIONS OF THE COLON.

To the Editor of THE LANCET.

SIR,—In Dr. Ryle's instructive paper mention was made of a few cases in which rectal pain was described. I have notes of two such, possibly worthy of publication. Both were males of lean appearance, intelligent, and not neurotic, whose symptoms were closely similar, and first noticed shortly after puberty. As exciting causes of pain were mentioned constipation, cold, and coitus. As regards the first of these, I incline to the belief that the hard, constipated motion resulted from the attack, for neither patient suffered normally in this manner, and inability to evacuate invariably followed, rather than preceded, the spasm. Sitting on a cold or hard seat was a potent exciting factor, but pain immediately following on the completion of coition was the symptom which eventually led both to seek advice.

In one, whom I examined in an attack, I found a hard, tender, and contracted colon in the left iliac fossa and, on introducing the finger into the rectum, great resistance was met owing to a similar spastic condition there. A second finger was introduced and lateral pressure exerted. The first result was aggravation of the pain which suddenly gave place to complete comfort coincidentally with relaxation of the affected segment. It is of interest to note in this connexion that the patient had discovered that a similar action on his part was the only certain means of abolishing the spasm. The pain itself was likened

to severe toothache, rapidly rising to its maximal intensity, and located deep to the sacrum and in the left iliac fossa. Its severity was described as almost unbearable, but it rarely lasted longer than ten minutes, and then disappeared completely in 30 seconds.—I am, Sir, yours faithfully,

London, W., Dec. 8th, 1928. A. H. DOUTHWAITE.

To the Editor of THE LANCET.

SIR,—In two previous publications (which have apparently escaped the notice of Dr. Ryle) I described the spastic conditions of the colon, accompanied or not by myxorrhœa, as syndromes of hypertonus of the parasympathetic centra of the colon. There are two distinct parasympathetic centra for the colon. The lower represented by a column of parasympathetic cells, situated in the first four segments of the sacral medulla, gives rise to the nervus pelvicus, and through it innervates the left colon. The superior centre is in the nucleus of the vagus itself and innervates the right colon, that is the ascending and the greatest part of the transverse. Right and left colon are two distinct organs, with distinct functions, a different embryological origin (the left colon derived from the hind gut, and the right colon from the mid-gut), and a separate innervation. These colon parasympathetic centra have intimate connexions with the central nervous system and with the cortex itself, and this explains the central nervous and even the cortical influences.

The over-stimulation of the colon parasympathetic centra is due: (*a*) to humeral or endocrinic factors acting on these centra; (*b*) to abnormal nervous impulses coming from the diseased colon itself—cancer or colitis; (*c*) to abnormal nervous impulses coming from any other diseased organ; (*d*) to abnormal nervous impulses coming from the central nervous system and therefore often from cortico-psychical disturbances.

For the accurate diagnosis of conditions of spastic colon, a thorough understanding of this mechanism is absolutely necessary, and therefore a precise knowledge of visceral neurology. I avail myself of this opportunity to plead for a rapid re-edition of the standard work on Visceral Neurology, Langley's "Autonomic Nervous System," which, unfortunately for the students of internal diseases, has been for a long time out of print.

I am, Sir, yours faithfully,

Wimpole-street, W., Dec. 7th. A. P. CAWADIAS.

THE RODS AND CONES.

To the Editor of THE LANCET.

SIR,—An annotation under this heading in your last issue contains a comment on my theory of vision. When I propounded this theory at two international congresses not only was there no dissent but the most emphatic approval. All the facts point to the conclusion that vision takes place by stimulation of the cones of the retina through photo-chemical decomposition of the liquid surrounding them which is sensitised by the visual purple. The rods are not percipient elements, but control the visual purple. Helmholtz stated that there was no evidence that the rods were percipient elements. This theory explains numerous facts which are otherwise inexplicable, such, for example, as the change in position in the field of vision of after-images on movement of the eye. Two after-images may combine into one, or a red after-image may go right through a green one. This proves conclusively that the stimulus is liquid.

Apart from the numerous facts against the duplicity theory, which supposes that the rods are percipient elements for perception in a dim light, it will be found that it is supported almost entirely by misstatements—namely: (1) that certain animals have only cones and others have only rods; (2) that the periphery of the retina is colour-blind; (3) that the eye is totally colour-blind in dark adaptation; (4) that the Purkinje phenomenon and the recurrent image are not found with the fovea. With regard to these I offer the following criticisms.

1. Though I have examined numerous collections I have never been able to find any animal with only rods or only cones, neither have I found anyone who has seen such a retina. The tortoise is the most quoted; it is stated to have only cones. The rods and cones in the retina of the tortoise are as clearly defined and distinct as in the human retina.

2. The periphery of the retina is not colour-blind when colours of sufficient intensity are used. The reader can test this for himself with a doctor's red lamp. He will find he can see it as red to the extreme periphery.

3. In dark adaptation the eye is not totally colour-blind. Further, there is no scotoma or blind area corresponding to the rod-free portion of the macula which is equal to a visual angle of about three degrees.

4. The Purkinje phenomena and recurrent image are found with the fovea. Hess showed not only that the recurrent image was found with the fovea, but also that it was bent outwards at this region as it would be if the visual purple had to flow into the fovea.—I am, Sir, yours faithfully,

London, Dec. 8th, 1928. F. W. EDRIDGE-GREEN.

SMOKELESS FUEL AND PUBLIC HEALTH.

To the Editor of THE LANCET.

SIR,—A letter under the above heading appears in your issue of this week. Besides being of great benefit for public health, low temperature carbonisation of coal should, if carried out to the extent necessary, bring at least some prosperity to the mining areas. With regard to the efficiency of it, I can speak from experience, as for the past six months I have had no coal in my house, and have been burning a fuel prepared by low temperature carbonisation, and with great success. It is as easy to light as the best coal, gives a hot and bright fire, no trouble with the flues, and a hot oven. In fact, since using it, we have had a far better cooking oven than with coal.

We are a conservative nation, and it takes a good deal to alter our ideas, and it is so with the use of coal; but once the process gets into full swing and the fuel is readily obtainable at a reasonable price, no one who has given low carbonisation fuel a fair trial will want to return to the use of raw coal.

I am, Sir, yours faithfully,

F. L. NICHOLLS.

Fulbourn, near Cambridge, Dec. 8th, 1928.

A TUDOR ACT OF INDEMNITY FOR UNQUALIFIED PRACTICE.

To the Editor of THE LANCET.

SIR,—Mr. Fred Bullock has given good reason for the sudden attack on the surgeons as a body by showing that it was in some measure due to the unwise exercise of their jurisdiction over unlicensed practisers of surgery. He has also given the correct meaning of certain mediæval medical terms mentioned in the Act. By the way, is the Romney document a copy of the Statute, or is it a Proclamation? I ask for information. But there are other factors which give the subject a wider interest—e.g., the principles which guided Henry towards the regulation of the medical profession. Educated for the Catholic hierarchy when, by the solicitation of his ministers, he was urged in the third year of his reign to regularise the profession of physic he gave to the Church the dominating power. By the Act (3 Henry VIII., c. 11) he ordained that no person within the City of London and seven miles should take upon himself to practise as a physician or surgeon except he be first examined, approved, and

admitted by the Bishop of London or Dean of St. Paul's calling to him four doctors of physic, and for surgery other expert persons in that faculty. Outside the City and environs similar powers were given to the bishop of each diocese or his vicar-general, in like manner calling to them expert persons; the privileges of Oxford and Cambridge Universities being safeguarded. Six years later (1518) at Wolsey's instigation, persuaded thereto by Linacre, Henry founded the College of Physicians by Royal Charter, whereby the power given to the Church by the previous Act was transferred, *so far as the practice of physic in London was concerned*, to the College. This charter was confirmed by Act of Parliament and enlarged in the following, among other, particulars. In the dioceses outside London it had been found difficult to procure men able sufficiently to examine candidates, and consequently it was enacted that no person should be allowed to practise physic throughout England, without examination and approval of the College. The Bishop of London, as well as the others in their respective dioceses, continued to license in surgery, but in London the practice had proved unsatisfactory. The surgeons were few, they were for the most part illiterate, and if we are to believe the preamble to the Act (34 Henry VIII., c. 8) they were grasping and unscrupulous.

Physic had been dealt with to Henry's satisfaction; for the good of his people his attention was drawn to the insufficiency of surgical knowledge. There were at this time two several and distinct companies of surgeons practising surgery in London, one large and influential, the Company of Barbers incorporated by Edward IV., the other, the Company of Surgeons, small, needy, and not incorporated. For the better control, exercise, and knowledge of surgery Henry deemed it expedient that these should be joined together as the United Company of Barbers and Surgeons of London (1540). By their charter they were empowered to govern the practice of barbery and surgery in London; the barbers were henceforth restricted to barbery—i.e., washing, shaving, and the drawing of teeth, and were forbidden the letting of blood or any other thing belonging to surgery; the surgeons were similarly forbidden to practise barbery.

As Mr. Bullock shows, the surgeons became arrogant, making unreasonable use of their monopoly by prosecuting those who had ministered to the wants of their neighbours without gain. To mitigate the rapacity of the approved surgeons who, "minding only their own lucres and nothing the profit of the diseased or patient, will do no cure without knowing that they will be rewarded with a greater sum or reward than the cure extendeth unto," the Act (34 & 35 Henry VIII., c. 8) took its place upon the Statute Book. In it the right was given to any person with knowledge of barbery, &c., to use ointments and plaisters to any *outward* sore, swelling, or disease, and to administer drinks for the stone and strangury, or agues, without penalty, any other Act to the contrary notwithstanding. The internal administration of medicine for all and every other disease came within the monopoly of the physician, himself entitled to practise surgery as well as physic. The Act of 1542–43 has been called "The Quack's Charter"; it is still unrepealed.

When Henry threw off the domination of Rome he recognised that, as it had been the custom of the Popes, through their legates, to confer extra-territorial degrees in theology, law, and physic, unless he provided for the continuation of the ecclesiastical prerogative, appeals would be made to the Roman Pontiff for such degrees. He therefore by Act of Parliament ordained that the Archbishop of Canterbury should have the power to grant certain faculties; these became known as the Lambeth degrees, which are still bestowed upon chosen candidates under this Act. But the M.D. Lambeth does not now of itself confer the right to practise medicine.

I am, Sir, yours faithfully,

GEORGE C. PEACHEY.

Randolph-crescent, W., Dec. 1st, 1928.

WHAT IS A BAD RADIOGRAM?

To the Editor of THE LANCET.

SIR,—I have read with interest the leading article in your issue of Nov. 24th entitled What is a Good Radiogram? and I agree with its assertions. At the same time it does not quite define the good radiogram. May I help by trying to define the bad radiogram?

A bad radiogram I would define as one which does not render the viscus it is supposed to portray to full advantage. It is not sharp or clear. It may be ill-defined owing to over or under exposure, over or under development, or one of several combinations of the above. All these factors may be correct, but the accelerating screen so faulty as to render the negative poor. The greatest of all faults is that the bad radiogram is taken, whilst the good one is made. By "taken" I understand that a film is placed on one side of the patient, and exposed to X rays, showing on it whatever presents itself at the time, and as it lies in the given position. On the other hand, the word "made" signifies that steps have been taken to make the film of diagnostic value, and that the correct time is chosen to render a given viscus at a stage when it is best filled. It is then to be shown on a "cleared deck," or so that superimposing coils of bowel are dispersed by angulation, gravity, or pressure by inopaque object, during the exposure, to reveal the part one wishes to show; or again, efforts are made to bring movable parts out of the pelvis by manipulation, then pinned down during the exposure, and thus the diagnostic value of a radiogram is enhanced. The original lie of the same viscus can be expressed in a statement, for instance, "cæcum, terminal ileum and appendix huddled up in pelvis."

And, secondly, a radiographic report may be successfully executed, and yet the diagnosis may be missed owing to faulty judgment. For this reason I feel guilty of neglect in every negative X ray report issued—guilty of errors of omission and too fixed technique, omission to observe carefully or demonstrate each viscus in many angles, omission to observe or demonstrate the site of each viscus in turn soon after clearance, to look for opaque spots which when found can be followed up and placed. Want of elasticity in the times of investigation can be the cause of bad radiographic reports, for instance, an appendix may be shown partly filled at eight hours, partly empty at 24, yet at intervening stages it would have presented full. Such an error of judgment produces two misleading radiograms.

Finally, I would like to say that you can put heads together by the score over a well-executed negative radiogram, only to waste their time, because it is faulty in judgment—when (say) 10 degrees of rotation would have revealed the evidence of a gross lesion.

I am, Sir, yours faithfully,

O. A. MARXER.

Ruthin Castle, North Wales, Dec. 3rd, 1928.

ROYAL NORTHERN GROUP OF HOSPITALS. — This group held a festival dinner on Dec. 5th at the Savoy Hotel, with the object of collecting £10,642 to complete the sum of £35,000, which an anonymous donor has promised to double when it is attained, in order to erect a block of pay-beds. Lord Bearsted, who took the chair, proposed "Success to the Hospital." He explained the position and surveyed the work of the Royal Northern Hospital, where the new block will be erected. The Marquess of Northampton appealed to local employers to encourage their workers to use the Contributors' Certificates scheme, by which receipts for donations are accepted as cash for treatment within ten years of their issue. Major Sir Archibald Boyd-Carpenter, proposing "The Voluntary System," suggested that the large motoring associations should approach their members to give a weekly contribution. The Rev. Basil Bourchier supported, and the Rt. Hon. H. J. Tennant responded. The health of the chairman was proposed by Mr. L. E. Barrington-Ward, and seconded by the Lady Amherst of Hackney. The secretary announced that the subscriptions to the festival totalled £13,134.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

LOCAL GOVERNMENT (SCOTLAND) BILL.

IN the House of Commons on Wednesday, Dec. 5th, the House went into Committee on the financial resolution in connexion with this Bill. Mr. JAMES HOPE was in the chair.

Major ELLIOT (Under Secretary of State for Scotland), in moving the resolution, said that in Scotland the total local government expenditure was £33,000,000, and was at present something in the ratio of £13,000,000 from grants and £20,500,000 from rates. After this Bill had gone through the proportion between rates and grants would be something like £16,000,000 from grants and £17,000,000 from rates. First of all it was proposed to sweep away the assigned revenues, and so on, and create a general Exchequer contribution which would be fed annually by such grants as Parliament might determine. Secondly, this grant would be further fed by a sum to compensate for the de-rating grants and for discontinued grants. The third point was that this grant would be revised quinquennially. The fourth point was that the grant would be to maintain a given ratio permanently between the total rate and grant-borne expenditure. That was to say, that in the future there would be a ratio preserved between the money coming from the Exchequer and the rate-borne expenditure which was a variable one. Therefore the Exchequer contribution was also variable upwards. There was a guarantee against varying downwards. The fifth point was that the grant should deal with what were called necessitous areas by being distributed according to needs and abilities, and it dealt with the question of necessitous areas in the widest possible sense. As regarded the distribution of the General Exchequer contribution the principles of the scheme were the same in both England and Scotland.

The Labour View.

Mr. WILLIAM GRAHAM, speaking for the Labour Party, said that whatever might be the problems of local finance in Scotland they were aggravated beyond description by this Bill and by the undeniable confusion that it would introduce. The Labour Party had always pleaded that it was altogether unjust that the structure of the poor-law in Scotland, which was never designed to carry a load of this description, had had to obtain in the aggregate from the ratepayers in all parts of the country millions of money since the industrial depression began. There was every reason in the world for the plea of the Labour Party that this should be made a national charge. The transfer would be followed by far-reaching and impressive results. The question for Scotland as for England was whether there was any real merit in the block system of grants as opposed to the percentage system. The burden of the attack upon the percentage system had been that under it the Chancellor of the Exchequer of the day did not know what exactly he had to contribute to those local services year by year. There was no foundation for that argument, as the financial machinery of the House provided for review and free determination of the estimates dealing with those grants. Moreover, no one had ever suggested that there had been any waste or misdirection by the Scottish local authoritics in expenditure under the percentage grant system. Having regard to the fact that the aggregate burden of the local rates in Scotland had bounded up until they were now £22,000,000, the proportion borne by the local authorities was so exceptionally high as to secure economy in the local services. He recognised that it was no use meeting the Government plan with a blind negative. They could easily mark off and arrange areas which could be treated specially as necessitous. By the Government scheme all kinds of fresh anomalies and new problems would be created in the necessitous areas. In a matter of this kind what they had to look to was a broad transfer from national funds and the extent to which such transfer would operate during the next 10 or 15 years. At the very heart of this problem there was the question of the funds to be provided to meet the necessary expansion of local services. If any new duties were imposed on the local authorities in Scotland they should clearly understand there was no real provision in the Government scheme of assistance from the Exchequer to meet the increased expenditure involved.

Development of the Public Health Services.

Dr. DRUMMOND SHIELS said that he was very disappointed that the Under Secretary of State for Scotland had omitted to make any comment upon, or to give any justification for, the proposed change in the method of financing public health services by bringing them into the ambit of a block grant instead of allowing them to continue under the percentage grant system. This was one of the most important matters in the Bill. The percentage grant system has been criticised on the ground that the more a district spent the more it got, but he thought that the Government would agree that in Scotland there was as yet no town or country district which had a really adequate public health system, or in which an excessive amount of money had ever been spent upon it. As a matter of fact they were not really abolishing the percentage grant system in Scotland. The portion which was to be included in the block grant was an infinitesimal part of the total sum, the bulk of which was still to be paid under the percentage grant system. It was a remarkable thing that the health services should be the one thing that had been put under the block grant system. The public health services were the most rapidly developing of all public services. He wondered whether that was the reason why those services had been selected for the change. He believed that the Minister of Health and the Secretary for Scotland were not unsympathetic to the development of the health services, but he strongly suspected the Treasury, which, as they knew, was a very powerful influence behind this Bill. Public opinion was ripe for a still larger development of these services. In many of the large towns in Scotland this year and the preceding year had been economy years, and yet this year was the one which was to be taken as the standard year, and if any development of the services now in existence were undertaken within the next five years it would mean that the expense would fall on the ratepayers and would have to be borne by a much smaller number of ratepayers than at the present time. That was a serious position. The hon. Member for Caithness and Sutherland (Sir A. Sinclair) had called attention to the fact, which was of great importance, that in his own county there was no maternity and child welfare service, and they knew that a number of other districts in Scotland were in the same position. Was it expected that any district which had no maternity and child welfare service at the present time was likely to establish one within the next five years, seeing that to do so would involve a very great increase in the local rates? There were figures to show that in Edinburgh last year in the case of mothers who had been given antenatal treatment there was a much lower percentage of mortality than in the case of those who had not been so treated. The figures showed that there were something like four or five times the number of deaths among those who had had no antenatal treatment as compared with those who had been previously attended. The importance of that was being realised, and in those cases where the service was not very adequate there was room for development, while in certain cases it had not been taken up at all. Was it likely that that would take place under this system of block grants? He asked that if the whole of the public health services could not be taken out of this block grant, that maternity and child welfare should at least be excluded from its operation and remain under the percentage system. For a number of years past the House and the Scottish Board of Health had put upon local authorities various new duties, some of them small and others very extensive. It was likely that in the next five years something of the same kind would take place. Not very long ago there was insulin, which the local authorities now had to supply, and there was a new duty imposed in regard to encephalitis. Under the Government's scheme localities would have to wait for five years before putting such developments into operation, or would have to put on the rates the whole expense of services which the House or the Scottish Board of Health might call upon the local authority to provide. It was obvious that some arrangement to meet that position should be made.

Block Grants v. Percentage System.

After further debate,

The LORD ADVOCATE (Mr. WILLIAM WATSON), dealing with the contention over the rival advantages of the block system of grants and the percentage system said that the main objection to the latter system was that under it the richer districts had a free hand in expenditure and the poorer districts were penalised. That was a very vital point, especially when they were considering the adequate development of, among other things, the health services. It was urged that the central authority should bear the whole burden. But the local authorities had some liabilities, and to expect the central authority on every occasion to be the person who was going to pay the extra expenditure, and in the case of the poorer districts the whole of the expenditure, was going too far. The question was: What was a fair proportion, and what was the fairest method of getting that proportion? The Government said that the block grant system was the fairer method of the two. They were just as determined in Scotland as the Ministry of Health was in England to see that maternity and child welfare services were fully protected and carried out.

The resolution was carried by 224 votes to 140—majority 84.

Medical Members and Local Government Bill.

At a meeting held at the House of Commons on Tuesday, Dec. 11th, attended by medical Members of the House, and by a deputation representing the British Medical Association, the medical aspects of the Local Government Bill were very fully discussed. It was decided that Lieut.-Colonel Fremantle and Sir Richard Luce should bring forward certain amendments designed to strengthen the Bill, but on the whole the deputation was understood to give general approval to the main provisions of the measure in regard to health matters, subject to confirmation by the Council of the Association at their meeting on the following day. An amendment, to which great importance was attached, will propose that the power given to a council under Clause 4 to deal with non-destitute as well as destitute persons by means of the health services which they provide under a series of Public Health Acts enumerated in the clause shall be made mandatory instead of permissive.

"Guillotine" Resolutions.

The House of Commons considered on Tuesday, Dec. 11th, a "guillotine" motion setting up a time-table for the subsequent discussions on the English and Scottish Local Government Bills. After several hours of debate it was decided to allot 17 days for the further stages of the English Bill divided as follows: Committee, 13; report, 3; third reading, 1. For the Scottish Bill 12 more days were allotted, divided as follows: Committee, 9 (one more than originally proposed); report, 2; and third reading, 1.

THE DISTRESSED AREAS.

On Wednesday, Dec. 5th, on the motion for the adjournment,

Miss WILKINSON called attention to the urgent need for clothing for the children in the necessitous areas, and asked whether it would be possible for the Government to give a Treasury grant.

Lord EUSTACE PERCY (President of the Board of Education) said that nothing he could say could exaggerate the extreme seriousness of this problem, but need they say that voluntary effort had so far failed to do its part of the task that it must be taken over as a State matter? In South Wales so far as nutrition was concerned the difficulty was that the cost of the food given to school-children was deducted from the poor-law relief given to the parents; but an agreement had been reached with the guardians that no deduction was to be made. Over the whole of Glamorgan the feeding of school-children was proceeding on the basis of medical selection, and in the Rhondda over 1000 children were being fed after medical certification. He sent down a medical officer a few weeks ago to look into the question of whether the standard applied was too stringent, and the report which he received was to the effect that the work was being thoroughly well done and that the ground was being covered, but that it was necessary that the medical inspection should be continued. That was being done at the present moment. His reports were that serious deterioration among children was being prevented. The question of Government assistance in relief of the distress was one which had to be, and would be, considered.

HOUSE OF LORDS.

THURSDAY, DEC. 6TH.

PROTECTION OF ANIMALS (AMENDMENT) BILL.

On the motion that the House do now resolve itself into Committee on the Protection of Animals (Amendment) Bill,

Lord DESBOROUGH said that he wished to explain at that stage the position of the Government in case at future stages of the measure any silence on their part might be misinterpreted. On the second reading he had done his best to show that the Government were not at all enthusiastic about it, and that they considered that its provisions were not of a workable character. Lord Banbury had had more than one interview with the Home Office and he was sorry to say that he had not been successful in removing the objections which they previously entertained. No complaints had been received by the Home Office that Section 3 of the Protection of Animals Act, 1911, had not worked satisfactorily up to the present, and it was the view of the Home Office that the present Bill could not be amended so as to make it a workable measure.

Earl RUSSELL said that it would be a waste of time to ask their Lordships to go on with a Bill which the Government had told them was quite unworkable. He therefore moved that the debate be adjourned.

Lord BANBURY, who was in charge of the Bill, said that the Under Secretary to the Home Office (Sir Vivian Henderson) had informed him on the previous day that the Home Office did not intend to oppose this Bill. He therefore suggested that their Lordships might pass the Committee stage, and if the Home Office had changed their minds before the third reading the House could then take what action they thought right.

After further discussion the motion to adjourn the debate was agreed to.

PRESERVATION OF INFANT LIFE BILL.

The House went into Committee on this Bill. The Earl of DONOUGHMORE was in the chair.

Punishment for Child Destruction.

Clause 1 of the Bill provides:—

(1) Subject as hereinafter in this subsection provided, any person who, with intent to destroy the life of a child capable of being born alive, by any wilful act causes a child to die before it has an existence independent of its mother, shall be guilty of felony, to wit, of child destruction, and shall be liable on conviction thereof on indictment to penal servitude for life: Provided that no person shall be convicted of an offence under this section if it is proved that the act which caused the death of the child was done in good faith for the purpose only of preserving the life of the mother.

(2) For the purposes of this Act, evidence that a woman had at any material time been pregnant for a period of 28 weeks or more shall be prima facie proof that she was at that time pregnant of a child capable of being born alive.

Lord ATKIN moved to leave out Clause 1 and to insert the following new clause:—

(1) A woman may be convicted of infanticide notwithstanding that the death of her child is caused by her in the course of delivery; and the term "newly born child" in the Infanticide Act, 1922, shall include a child while in the course of delivery.

(2) For the purposes of this Act the course of delivery shall be deemed to continue until the child has an existence independent of its mother.

He said that when the Bill came before the House for second reading he took objection to it upon the ground that it went much farther than was necessary and that in particular it exposed professional men to the danger of being charged with an offence which was a new offence, and one which it was unnecessary to put upon the Statute Book. He was prepared to admit that the present gap in the law ought to be remedied, and his amendment did in terms precisely provide for that position. The amendment proposed that instead of the new offence being created the offence of infanticide should be extended so as to include the case of the killing of a child by the mother in the course of delivery. The Bill as it stood went much farther than that in two particulars. In the first place it extended the offence to third persons other than the mother. He knew of no cases in which it had ever been suggested that there was a deliberate act of killing a child in the course of delivery, unless it was by a doctor or a midwife. From the nature of things it was practically impossible that there should be anyone else capable of killing the child during birth. He was very reluctant that a new offence should be created which would comprise professional men and professional women—because midwives now had to be licensed—and which could expose them to the possibility of a charge of this kind. It happened from time to time that the doctor had to make up his mind that in order to save the mother's life the child must be sacrificed. This Bill in the terms of it would make such a doctor liable to a new offence punishable by penal servitude for life unless he discharged the onus of showing that he did it in good faith for the purpose of preserving the life of the mother. He objected very strongly to any onus being put upon anybody to prove that he was innocent, and he thought it was very inadvisable that a new offence should be created under which professional men and women would carry on their very important vocations with a possibility of a criminal charge being brought against them, either by a disappointed parent or a mischievous attendant. He had made inquiries and he had not come across a single instance in the whole history of the administration of the criminal law where it had been suggested that there had been an improper act done to a child by a third person other than the mother in the course of birth. Under the present law coroners had the duty to hold inquiries on the births of children, including stillbirths, and he knew of no case where in such circumstances any suggestion had been made that any third person had committed an offence. It was quite sufficient to meet the only evil to which attention was originally called—namely, the case where a mother was supposed to have killed her child in the course of delivery. There was another provision in the Bill which was objectionable; that was that the offence was not confined to the killing of a child in the course of birth, but was extended to the killing of the child before delivery had begun, while it was still in the body of the mother, and she was still pregnant. That was an unnecessary proposal, because it

would overlap the existing law as to procuring abortion. The practice of abortion was very rife in these days, and caused where it was successful untold pain and suffering and in many cases death. The present law as to abortion provided that any person who used any means, either instruments or any other, with the intention of procuring a miscarriage, committed an offence which was punishable by precisely the same punishment as was provided in this Bill—namely, the maximum punishment of penal servitude for life. He was advised, and had found it to be so in books of authority upon medical jurisprudence, that it was really impossible to kill a child in the body of the mother without procuring a miscarriage, and without therefore obviously intending to procure a miscarriage as the natural result of the action taken. In that respect the provision in the Bill was unnecessary, and indeed was undesirable, because it weakened the law as to abortion by narrowing it and by creating an offence which required that there should be an intention to kill the child; whereas it was not necessary in the ordinary law as to abortion. He hoped that their Lordships would limit the scope of the Bill, because as it stood it was very undesirable from the point of view of the medical profession and the nursing profession.

A Grave Offence.

Lord MERRIVALE said that why Lord Atkin should be ready to leave one branch of this class of offence to be a felony, punishable by penal servitude for life, and as to the major area should say it was sufficiently dealt with by a slight provision creating a new misdemeanour, passed his comprehension. The offence was a most grave offence. There were aspects of the crime of abortion with regard to the living person and with regard to the unborn child which it was not necessary to dwell upon, but which emphasised the gravity of the matter. Lord Darling had framed a Bill which was accepted in principle by their Lordships' House and then sent to a Select Committee. All that the Bill was designed to do was to provide that in the case unprovided for the penalty of abortion should be incurred by those who were engaged in the act. That seemed to be entirely consistent with the policy which had been pursued in our judicial administration. He had great difficulty in seeing how this grave offence could be guarded against, in this particular in which there was almost an invitation to criminally minded people to take the action they were so ready to take, until they put the law on an even footing. Lord Atkin had been concerned about the effect of the proposals in respect of the liability of medical practitioners and registered midwives. He (Lord Merrivale) said that all due effect should be given to that legitimate concern. No self-respecting person, no person of any experience, wished to imperil a decent doctor who had performed a terrible task and had deprived a fellow creature of life. No one wished that he should be lightly exposed to criminal proceedings. But it was not the respectable medical practitioner who ran this risk, or the decent midwife; it was the people who at the present time practised abortion, and who in a vast number of cases escaped without any penalty because it was a crime most difficult to bring home to those who were guilty of it. He would regard it as a mockery to pass a Bill through that House which left the people who provided the means for this crime, and actually put it into effect, free of risk, and put such penalty as might be incurred upon the unhappy woman who for money they involved as an accomplice in a criminal transaction. It seemed to him that their Lordships would abundantly provide for the security of the respectable medical practitioner and the respectable midwife if a clause or subsection were inserted which provided that there should be no prosecution of a registered medical practitioner or a registered midwife without the sanction of the Attorney-General. He hoped their Lordships would not accept the amendment of Lord Atkin.

Lord PARMOOR said that it was a matter of very great importance that in questions of this kind they should not make the law harsher than was absolutely necessary in order that the crime might be suitably punished both as a deterrent and as a punishment in a particular case. The Bill as it stood was unduly harsh, and if Lord Atkin pressed his amendment to a division he (Lord Parmoor) would vote for it.

An Uncontrolled Evil.

Lord DARLING said that the amendment was only a new method of doing what the noble lord attempted to do when he moved the rejection of the Bill. The amendment if carried would leave a great part of the evil which the Bill attempted to prevent absolutely uncontrolled. It would deal with the case where a woman in labour purposely killed the creature before it had got a separate existence, and with that alone, and it would say that that offence was nothing more than an offence of infanticide which involved a comparatively slight punishment. As the law stood at present a woman who desired not to have a child born alive and continuing to exist could go to a professional abortionist—and there were many of them—and tell him that she was expecting her delivery at such a time and that before it had got a separate existence he was to kill it. It was the law of England that if this were done he would commit no offence whatever, and if the amendment were carried that monstrous condition of things would still be the law of England. Mr. Justice Talbot had assured him that there were far more of these cases than people who did not attend assizes had the least idea of. The proposal of the Bill was not suddenly forced upon an astonished world; it had been thought of for a long time. They were not creating a new offence, except in a very technical meaning of the word "offence." He could not accept the amendment, because it would be fatal to the Bill, and would practically give a charter to criminal persons to go on killing creatures who were almost living souls.

A Gap in Criminal Law.

The LORD CHANCELLOR said that in speaking on this Bill, which was a non-party measure, he was expressing his own and not the Government's views, charged perhaps with special responsibility having regard to his official position in the House. The Bill having been given a second reading, the House had committed itself to the principle that there was a gap in the criminal law which it was desirable to fill. They must consider what was the right way to stop that gap and determine exactly what the gap was. It was by law murder deliberately to take the life of a child when it had once become a separate entity and had in a legal sense a separate existence. It was a felony to kill a fœtus. But by English law a child had not got a separate existence merely by reason of the fact that it was born; it had to be proved that the child had acquired a separate existence and that circulation was separate and distinct from that of the mother. They must appreciate that attention had now been drawn to the fact that this was a way to procure what was practically abortion with impunity, and they were aware that unfortunately there were people who made a trade of procuring abortion, and a profitable trade in proportion to its danger. During the second reading debate on the Bill he had expressed regret that public attention had been drawn to what had not been generally known, and he feared that with the public knowledge now given advantage might be taken of this gap in our jurisprudence. Now that the gap had been disclosed it became incumbent on them to close it. The practice of abortion was rife in this country. If the amendment was carried an abortionist would be able to say to a woman, "I cannot take the risk of procuring an abortion, but tell me whenever your child is being born, and I can get rid of it with perfect safety and I shall have committed no offence at all." As to Lord Atkin's point about the difficulty which would be created for a doctor who was acting in good faith, he (the Lord Chancellor) advised Lord Darling to accept or introduce an amendment which would make it clear that the doctor was not charged with the burden of proving that he was acting in good faith; or, if their Lordships preferred it, to accept the suggestion of Lord Merrivale that no prosecution should take place under the Bill without the previous fiat of the Attorney-General. From experience he thought probably that would be a very adequate protection. He did not think that when they had made it clear that as long as the act was done in good faith it was no criminal offence that they were really putting the medical man in a position of embarrassment, because one knew that it was necessary sometimes to procure abortion for the sake of the mother of the unborn child, and he had never heard that any doctor had been embarrassed, or had hesitated in the discharge of that duty, by reason of the knowledge that if he was not acting in good faith he would be guilty of a criminal offence. At the same time he agreed that care must be taken to see that the offence was not made to go farther than was necessary. He submitted that the amendment ought to be rejected and that the Bill ought to be allowed to remain in its present form, but that, probably most conveniently on the Report stage, some provision might properly be inserted to secure that the position of the doctor, or the properly certified nurse, or midwife, or nurse acting as a legitimate *accoucheur*, should be adequately protected.

Lord ATKIN, in pressing his amendment to a division, repeated his view that if their Lordships passed the Bill in its present form there would not be sufficient protection for medical men and registered midwives. The Bill went much too far and involved possible hardship to professional men and women.

The amendment was defeated by 10 votes to 11.

Clause 1 and the remaining clauses of the Bill were agreed to and the Bill was reported without amendment to the House.

HOUSE OF COMMONS.

WEDNESDAY, DEC. 5TH.

Health of the Mercantile Marine.

Dr. VERNON DAVIES asked the President of the Board of Trade if he had consulted the Minister of Health with regard to the preparation of an annual report on the health of the merchant service; and, if so, what decision had been arrived at.—Mr. H. G. WILLIAMS, Parliamentary Secretary to the Board of Trade, replied: As a result of consultations which have taken place between the Ministry of Health and the Board of Trade, a joint standing committee has been set up to advise the two departments on matters of common interest affecting the health of the Mercantile Marine. The question of the preparation of a report on the health of the Mercantile Marine will be one of the first questions which the committee will be asked to consider.

THURSDAY, DEC. 6TH.

Women Patients in Mental Hospitals.

Sir ROBERT NEWMAN asked the Minister of Health how many women patients of unsound mind were detained in borough or county mental hospitals in England and Wales where there was no woman member on the visiting committee; how many of these were detained in hospitals under the control of councils who had no women members and were prevented by law from coöpting women on these committees; and whether he intended to propose legislation making it compulsory that a certain number of women should be appointed to serve on all county and borough mental hospital visiting committees where women were detained.—Mr. CHAMBERLAIN replied: Information in regard to the first part of the question is not available. The point raised by my hon. friend in the latter part of the question has been noted for consideration when legislation dealing with the subject is proposed.

Factory Inspection in Glasgow.

Mr. BUCHANAN asked the Home Secretary the number of factories employing women in the city of Glasgow last year which were inspected by factory inspectors; the number not so inspected; and how many prosecutions took place as the result of visits paid.—Sir WILLIAM JOYNSON-HICKS replied: I am informed that the figures are 1259 factories inspected during 1927, 191 not inspected, and 13 prosecutions resulting from the inspections.

Disinfection of Taxi-cabs.

Mr. DAY asked the Home Secretary whether his attention had been called to the evidence given in a recent case in which it was stated that taximeter cabs in garages were used for sleeping in at night by homeless persons; and whether there were any regulations making it incumbent upon the proprietors of all taximeter cabs to have them regularly disinfected.—Sir W. JOYNSON-HICKS replied: Inquiry has been made at the garages of motor-cab proprietors and it has been ascertained that the use of taxicabs for sleeping in at night or for any unauthorised purpose is not countenanced by the proprietors of these vehicles. If it is done, it is done without their knowledge or consent. The disinfection of taxicabs is not a requirement in the Commissioner's Conditions of Fitness, but it is required by law when the vehicle is known to have conveyed a person suffering with an infectious disease. It is the general practice for proprietors to brush and dust the interiors of the cabs before they are taken from the garages to ply for hire, and in many cases it is known that the linings and cushions are sprayed with some form of disinfectant and the floors scrubbed with soft soap and hot water. Motor-cabs are continually under the surveillance of public carriage officers and numerous cases are reported to them annually where it is considered that the interiors of cabs are unsuitable in the public interest from the point of view of cleanliness.

MONDAY, DEC. 10TH.

The Distressed Areas.

Mr. DAVID GRENFELL asked the Prime Minister whether he would take steps to coördinate under Government auspices the various agencies which were taking part in relieving distress and hardship in the depressed industrial areas, and whether the Government would give a grant towards a fund for this purpose.—Mr. BALDWIN replied: The whole matter is under the close consideration of the Government, and a full statement will be made at an early date. I can, however, make the following statement this afternoon. Owing to the increasing number of agencies for the relief of distress in the coalfields, it has become necessary to set up some machinery for their coördination. At the same time the Lord Mayor has invited the Government to place at his disposal the staff and office accommodation necessary to deal with the additional work due to the recent expansion in the operations of his fund. The Government have gladly responded to this request, and Mr. Noel Curtis-Bennett, C.V.O., has been appointed as organising secretary of the fund. In addition to his duties in connexion with the Lord Mayor's Fund, Mr. Curtis-Bennett will also undertake the organisation of a general clearing-house of information for the purpose of coördinating the numerous efforts which are now being made to relieve distress in the coalfields. In this work of coördination the Government feel sure that they can rely on the cordial coöperation of all the various relief agencies.

Meals for School-children.

Mr. JAMES HUDSON asked the President of the Board of Education (1) how many local education authorities in South Wales and Durham were carrying out in the schools the process known as medicinal feeding; of what diet did this process consist; and whether he was exerting any influence upon the authorities to adopt this process in preference to the provision of meals as allowed under the Education (Provision of Meals) Act. (2) How many local authorities in the mining districts of South Wales and Durham had adopted the Education (Provision of Meals) Act and were providing meals on the ground that children were hungry; how many authorities had not done so; and whether he had influenced the policy of the education authorities in this matter. (3) If he had made recommendations to the local education authorities as to the frequency of medical examination of all children in the schools of the distressed areas; and what length of time, computed on an average of all these children, elapsed between one examination and the next when these were undertaken for the discovery of such malnutrition as the Board considered requisite for the provision of school meals.—Lord E. PERCY replied: Of 20 local authorities in the mining districts of South Wales and Durham 12 are already providing meals for school-children, two are preparing to do so, and six are not, so far as I know, providing any meals. Five of the authorities who are now providing meals are doing so on a medical basis of selection, and I understand that one other authority is preparing to adopt this basis. Some months ago I communicated with the local government authorities in other mining areas suggesting that a special medical survey of the schools should be made before the end of the summer term. As a result of this survey feeding has now been undertaken in certain of these areas also. Children selected on a medical basis may be provided with ordinary dinners, or with special nourishment, such as milk, cod-liver oil, and malt. I have emphasised the importance of local authorities making adequate provision for malnourished children on many occasions during the course of this last year, and I have pointed out some of the advantages of the medical basis of selection as compared with the income basis, but I have put no pressure upon them to adopt the former in preference to the latter. Where the medical basis is adopted I have urged that borderline cases should be re-examined at frequent intervals, and that the schools as a whole should be periodically re-surveyed. In certain cases arrangements are also made for the temporary feeding of children between the visits of the medical officers if the head teacher has reason to believe that any child is not receiving sufficient food. Perhaps I may add that the distinction which appears to be drawn in the hon. Member's questions between medicinal feeding and feeding children who are hungry is based on a misapprehension. "Malnutrition" for this purpose means that the child is "unable by reason of lack of food to take full advantage of the education provided for it." This is the test prescribed by the Education Act, and the distinction is between selection on this basis by medical inspection and supervision of the children themselves and selection according to the size of the parents' income.

Mr. JENKINS asked the President of the Board of Education: (1) What number of Glamorgan children in the elementary schools were receiving milk and malt; whether these children were improving in health and physique; were they receiving the nourishment for seven days weekly or for school days only; and what percentage of the cost would be borne by the Board. (2) What percentage of children in the Glamorgan elementary school area who were attending school were in need of food; and, if there were any, would he make a grant for that purpose.—Lord E. PERCY replied: In the schools which have been surveyed by the Glamorganshire Education Authority the percentage of malnourished children was found to vary between 0·9 and 8·9. The number of school-children receiving milk during the week ending Nov. 30th was 698, of whom 57 were given, in addition, cod-liver oil and malt. I am advised that the improvement in health and physique shown by children who have received this treatment for some time is clearly marked. I understand it is provided on school days only. Grant is payable by the Board on the Authority's net expenditure at the rate of 50 per cent.

Anti-distemper Vaccine.

Mr. CRAWFURD asked the Minister of Agriculture if he was in a position to state whether the recently discovered anti-distemper vaccine was an effective preventive of that disease; and, if so, whether the Government was prepared to give aid in making its application universal.—Mr. GUINNESS replied: I am aware that the *Field* Distemper Research Committee has recently announced that an effective method of vaccinating dogs against distemper has been discovered. I understand that the Committee has offered to assist commercial laboratories or institutions willing to prepare the vaccine and make it available to the public. No public funds are available to assist the preparation or distribution of the vaccine. The Ministry's responsibility in respect of diseases of the dog is confined to diseases such as rabies, which are communicable to farm live-stock or human beings.

Mr. CRAWFURD asked whether, if this was an effective preventive, it did not mark a very important milestone in the treatment of dogs, and if the Government could help in the efforts which were being made in this direction by recommending a grant to help to make the application of the vaccine universal.—Mr. GUINNESS replied that he agreed as to the great importance of this discovery, but he did not see any necessity for a Government grant, seeing that the discovery was now past the experimental stage, and there was every hope that it would be taken up in the ordinary course by those whose business it was to supply these vaccines.

Dr. VERNON DAVIES: Is it not a fact that this is a direct result of experiments made on dogs?—Mr. GUINNESS: I believe that is so.

TUESDAY, DEC. 11TH.

Treatment of Blind Persons in Scotland.

Mr. BUCHANAN asked the Secretary of State for Scotland if he had received any request from the West of Scotland Committee for the Welfare of the Blind for permission to spend added sums for the treatment of the blind; if he could state the nature of such request; and what had been the answer.—Sir JOHN GILMOUR replied: I assume that the hon. Member's question has reference to recent proposals by the Glasgow and South-West of Scotland Joint Committee for the administration of the Blind Persons Act to establish a central clinic for the medical certifications of blind persons and to institute a scheme of allowances to blind persons who are unemployable. The Scottish Board of Health have approved the proposal to establish a central clinic. They have also indicated to the Joint Committee that they will be prepared to approve any schemes of allowances on reasonable lines that the Joint Committee may submit, but that no State grant will be available towards the cost of such a scheme.

Mr. BUCHANAN asked if it was not possible for the Secretary for Scotland to reconsider the question of a State grant for this very laudable service.

Sir J. GILMOUR said that the whole matter would come under review in the reform of local government with which the House was now dealing.

Mr. N. MACLEAN asked whether, as the Secretary for Scotland was so determined to approve of this particular object, that approval ought to carry with it some form of State grant.

Sir J. GILMOUR: Not necessarily.

Share Fishermen and National Health Insurance.

Sir ROBERT HAMILTON asked the Secretary of State for Scotland if he was able to state when the regulations covering the payment of contributions in respect of the admission of share fishermen to national health insurance would be published.—Sir JOHN GILMOUR replied: Notice of proposal to make a special Order will be published in the *Gazette* on Friday next, and a provisional special Order will be laid before the House immediately thereafter.

Relief of Distress in Yorkshire.

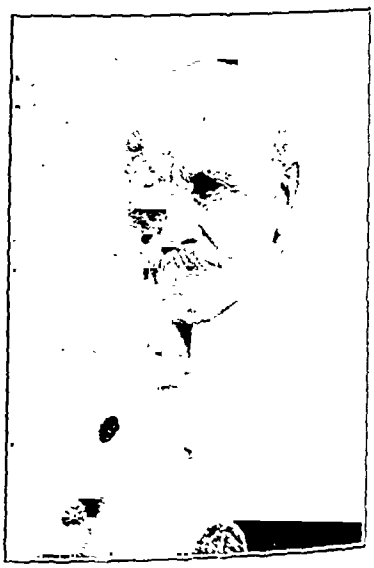
Mr. RENNIE SMITH asked the President of the Board of Education if he could give a detailed statement of the needs of school-children in the West Riding of Yorkshire as to food, boots and shoes, and clothing, and the extent to which these needs were being met by the activities of his department.—Lord EUSTACE PERCY replied: There are 22 education authorities in the West Riding. Of these, during the week ended Dec. 1st, 12 were providing meals for 5000 children. I have, as yet, received no official return from the West Riding County Authority, but I understand that they also are now feeding about 1000 children. Of the remaining nine authorities, some are understood to be making preparations for feeding. Surveys by the authorities' medical officers of the condition of the children were conducted in a number of the areas last summer, and recently in the Barnsley area. The results of the surveys varied considerably in different areas—e.g., 8 per cent. of the children were found to be malnourished in the districts of the county surveyed, and 3·6 per cent. in Barnsley. In Doncaster, Pontefract, Rotherham, and Sheffield the surveys failed to reveal at that time any abnormal conditions. The surveys are concerned primarily with the state of nutrition of the children, and I have not the same amount of information in regard to boots and clothing, but they tended to confirm what is generally known as to the unsatisfactory state of the children's boots and clothing in the distressed areas. Thus, in the West Riding survey of last summer 21 per cent. of the 44,000 children examined were found to have bad boots: in the recent Barnsley survey approximately 6 per cent. were returned as badly clothed.

Obituary.

SIR JOHN PHILLIPS, M.D. CAMB., F.R.C.P. LOND., J.P.

WE regret to announce the death of Sir John Phillips, honorary physician to the Queen, which occurred in London on Saturday last at the age of 73 years.

John Phillips was born at Pavenham, near Bedford, on July 6th, 1855, his father being Zachariah Phillips, of Birchmoor Manor, and his mother Ann Ayres, of Barford. He was sent to school at Bedford, from which he entered St. John's College, Cambridge, where he took the Natural Science Tripos before going on to clinical study at King's College Hospital, London. After qualifying M.R.C.S. Eng. in 1879 and M.B. Camb. in 1881, his bent soon showed itself in the direction of obstetrics, and he worked steadily up the ladder at King's College Hospital, where he was elected assistant obstetric physician in 1889 and full physician in 1898. On retiring after 17 years' service, in 1915, he was appointed consulting obstetric physician. During the greater part of this time he was lecturing on obstetric medicine at King's College, where he held the chair of obstetrics from 1904 to 1915; he was also physician to the British Lying-in Hospital and obstetric physician to the Bromley Cottage Hospital. He became a Member of the Royal College of Physicians in 1885, and was elected to the Fellowship in 1892.



SIR JOHN PHILLIPS.

Photograph by Elliott & Fry.

At King's College Hospital he succeeded Dr. W. S. Playfair on the staff, and he was associated for many years with this renowned accoucheur both in hospital work and in private practice. Like most of his generation of specialists, Phillips was more of an obstetric physician than a gynæcological surgeon. He had remarkable hands, which might have been specially designed by Nature for his work; the fingers were unusually long, fine, and flexible. To those who had the good fortune to see him at work his gentle

manipulative skill seemed almost uncanny. He seemed never to force and never to injure. With such attainments added to a natural charm and gravity of manner, and an impressive appearance, he quickly secured the best private midwifery practice in London, and held it for as long as he wanted. His experience and eminence early brought him to the notice of the Royal Family, and he was appointed honorary physician to the Queen in 1918. The surgery of gynæcology he had to teach himself—he inherited no tradition, and none of his immediate seniors at his hospitals had a surgical bent—and it was remarkable what a high degree of skill he reached. His diagnosis was most careful, and very few of his patients were operated on until they had spent at least a week in his ward under observation, including an examination under an anæsthetic, and every method of investigation which was deemed helpful. In consequence he scarcely ever met anything unexpected when he opened the abdomen. He was a deliberate, careful operator, who paid great attention to hæmostasis, and employed antiseptics liberally. Needless to add, his operative results were extremely good.

Phillips was far too busily engaged in the practice of midwifery to be a prolific writer during the last half of his professional career, but in his earlier years he contributed freely to the literature of his specialty. The "Outlines of Diseases of Women," which first saw the light in 1893, was designed for the use of the student and junior practitioner, and kept closely to first principles, stress being laid on the importance of accurate acquaintance with the anatomy of the female pelvic organs for the proper study of the diseases of women. This text-book ran through four editions between its first date of publication and 1906. He was particularly interested in everything that might lead to the amelioration of the pains of childbirth, and his contributions to medical journals include papers on the value of cocaine in obstetrics, and on the analgesic value of antipyrin administered intra- and post-partum. He contributed a chapter on plastic operations in gynæcology to the second edition of Allbutt and Playfair's System of Gynæcology, and on vaginal operations to Cheyne and Burghard's System. Ten years ago in our own columns he considered the lessons to be drawn from the seven maternal deaths which had taken place among some 2100 confinements which he had conducted in private over a period of 35 years. From 1893 to 1895 he was one of the co-editors of the King's College Hospital Reports.

Sir John Phillips married in 1890 Rachel Rattray, daughter of the late Robert Tweedie Middleton, M.P., D.L., by whom he had one son and three daughters. Her death in 1915 ended an ideally happy union. To this misfortune was added another—namely, a gradual failure of vision due to glaucoma, which was not arrested by the operation of iridectomy. For the last five years of his life he was almost completely blind, and during this time he was devotedly cared for by Miss Beatrice Margaret Naish, daughter of the vicar of Upnor, Kent, whom he married in 1926.

NORTHAMPTONSHIRE HOSPITALS.—On Saturday last Princess Mary opened an extension of the Manfield Orthopædic Hospital and laid the foundation-stone of two new operating theatres at Northampton General Hospital.

PAYMENT TO HOSPITAL IN ACCIDENT CASES.—At Leeds Assizes on Dec. 1st damages of £800 were awarded to a bricklayer who brought an action against a coöperative society for alleged negligent driving, whereby he was injured. The jury found for the plaintiff. In entering judgment for the amount claimed, Mr. Justice Roche directed that £160 be paid to the York County Hospital, where the plaintiff had been a patient.—The board of management of the Royal Salop Infirmary has been authorised to enforce claims for maintenance owing to the increasing demands made on the institution for the treatment of accident cases. Charges will be made where patients have private means or are insured, or have a legal claim for damages against the person responsible for the accident.

Medical News.

UNIVERSITY OF CAMBRIDGE.—The following degrees were conferred on Dec. 7th:—

M.D.—Wilfred Shaw.
B.Chir.—H. N. Webber (by proxy) and Harold Girling.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—The Council considered the following resolution, which was carried at the annual meeting of Fellows and Members on Nov. 15th.

That this fortieth annual meeting of Fellows and Members again affirms the desirability of admitting Members, who constitute nine-tenths of the College, to direct representation upon its Council.

Further, that in consideration of the importance of the health of the nation and of the fact that some 18,000 Members are in daily contact with the sick, it is most desirable, for the benefit of the public as well as of the College, that Members fulfilling such an important function should have some share in the deliberations of the College to which they belong.

The following reply to the resolution was adopted:—

In view of the recent postal vote of the Fellows, the Council is not prepared to take into further consideration at the present time the question of altering the constitution of the College so as to give Members of the College direct representation on the Council.

The main function of the College is to promote the study and practice of surgery. If there are any matters in this connexion affecting the health of the nation to which Members of the College wish to draw attention, an opportunity for so doing is afforded at the annual meeting of Fellows and Members, while the Council will at all times welcome and give careful consideration to representations made to it by any Member or body of Members of the College, in reference to matters which come within the functions of the College.

At a meeting of the Council of the College on Dec. 5th, with Sir Berkeley Moynihan, the President, in the chair, Prof. Ernest W. Hey Groves was elected a member of the Court of Examiners in the vacancy occasioned by the retirement in rotation of Mr. V. Warren Low.

At the Final Examination for the Fellowship held from Nov. 15th to 29th, 122 candidates presented themselves, of whom 39 were approved (38 men and 1 woman). Three candidates, although successful at the examination, have not yet complied with the by-laws and are therefore not entitled to receive their diploma. Diplomas of Fellow were accordingly conferred upon the following 36 candidates:—

H. S. Allen, Cambridge and St. Thomas's; C. B. Andrews, Guy's; J. C. Barrett, V.C., St. Thomas's; C. E. Beare, Middlesex; J. M. Buchanan, Melbourne and London; R. W. Butler, Cambridge and St. Thomas's; A. M. Clare, Leeds and London; J. B. Crabtree, St. Bart.'s; J. Crooks, Edinburgh; J. H. Doggart, Cambridge, St. Thomas's, and St. Bart.'s; V. H. Ellis, Cambridge and St. George's; G. M. Gray, Aberdeen; Dorothy W. Hall, Liverpool and St. Mary's; A. W. Holgate, Univ. Coll.; M. K. Hussein, Cairo and St. Bart.'s; B. L. Jeaffreson, St. Bart.'s; J. S. Loughridge, Belfast and St. Bart.'s; D. H. MacLeod, Middlesex; A. McMillan, Birmingham; C. M. Marshall, Otago; J. P. Monkhouse, St. Mary's; F. W. G. Nash, Middlesex; E. S. Page and G. E. Parker, Cambridge and St. Thomas's; T. V. Pearce, St. Thomas's; I. Price, King's Coll. and London; L. A. Richardson, Cambridge and St. Thomas's; A. Sourasky, Leeds; H. B. Stallard, Cambridge and St. Bart.'s; G. H. Steele, Univ. Coll.; S. N. Taylor, Manchester; C. I. Tuckett, Cambridge and St. Thomas's; J. M. Turner, Guy's; G. B. W. Walker, Cambridge and St. Mary's; J. J. Walsh, Dublin and London; and J. R. M. Whigham, St. Mary's.

Diplomas of Member were conferred upon the following:—

A. S. Rajasingham, Ceylon and Middlesex; and Florence Whitrow, Manchester.

Licences in Dental Surgery were conferred upon the following 48 candidates:—

F. Allott, C. A. W. Archer, and L. Ashling, Guy's; D. B. Atkinson, Royal Dental; W. L. Baker, Univ. Coll.; W. J. Brown and G. M. Conder, Royal Dental; H. J. Cracknell and H. M. Crombie, Guy's; H. H. Daniels and T. F. Dixon, Royal Dental; J. G. Douglas, J. G. T. Edmonds, and I. C. Fisher, Guy's; H. W. F. Freeth, Royal Dental; H. S. Gare, Guy's; A. A. Garlat, Univ. Coll.; U. Goldberg, Royal Dental; W. M. Graves-Morris, Guy's; J. Greenhalgh, Manchester; G. E. Hansen, C. S. Henderson, F. L. Hossell, C. N. Howitt, E. C. Irish, and F. R. Kearsley, Guy's; B. Kopkin, Univ. Coll.; S. Kutnowski, London; W. H. Lean, Royal Dental; C. M. Leckie and H. O. Lyne, Guy's; Muriel H. Millard, Royal Dental; W. N. Pike and P. J. Pretty, London; E. S. Rose, Royal Dental; W. J. Scobie and F. B. W. Sexton, Guy's; D. M. Shaw, Royal Dental; A. W. G. Small and J. T. F. Tingle, Guy's; W. Underhill and R. C. B. Webster, Royal Dental; D. S. H. Williams, C. B. Williamson, and H. Winter, Guy's; G. H. Wood, Univ. Coll.; S. F. Wright, Guy's; and A. Zamkov, Royal Dental.

ROYAL SOCIETY OF MEDICINE.—The Society's house and library will be closed from Saturday, Dec. 22nd, to Thursday, Dec. 27th, both days inclusive.

UNIVERSITY OF LONDON.—At a meeting of the Senate on Nov. 21st the degree of Ph.D. in Immunology was conferred on J. T. Cornelius, of the Lister Institute. Prof. G. E. Gask, director of the Surgical Unit, St. Bartholomew's Hospital, has been elected Dean of the Faculty of Medicine for the period 1928–30.

The Geoffrey E. Duveen Travelling Studentship in Oto-Rhino-Laryngology, of the value of £450, will be awarded annually to a student who has obtained the degrees of M.B. and B.S. in the University. The tenure of the studentship will in the first instance be for one year, which will be spent in study abroad, but such tenure may be extended for one or two years and during the extended period the student may be allowed to undertake research at the Royal Ear Hospital or some other laboratory approved for the purpose. Applications must be made on the prescribed form obtainable from the Academic Registrar of the University, and should be sent so as to reach him not later than Dec. 31st.

UNIVERSITY OF BRISTOL.—A dissertation by A. M. Critchley for the degree of Doctor of Medicine has been approved.

At recent examinations the following candidates were successful:—

M.D.

C. B. Perry.

FINAL EXAMINATION FOR M.B., CH.B.

Part I. (including Forensic Medicine).—*J. F. Coates, Eveline M. D. M. Collinson, *H. F. G. Corfield, J. Ll. W. Davies, J. J. J. Giraldi, R. D. Jones, *G. F. Langley, R. A. Lattey, R. P. Lucas, J. E. Newton, and S. C. Wake.

* With distinction.

Part I.—U. M. Hopkins, W. L. Sleight, and H. M. Strover.

Part II.—A. A. Dowling (with distinction in Obstetrics) and H. D. Pyke (with second-class honours and distinction in Obstetrics). G. R. Fells (with distinction in Public Health) and Ethel M. Redman. *In Group II. (completing examination):* Phœbe C. Vine.

Barbara J. Shapland passed the Final Professional Examination for the Diploma in Dental Surgery.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.—At the annual meeting of the College on Dec. 6th Dr. Robert A. Fleming was re-elected President for the ensuing year; Dr. Robert Thin was nominated vice-president; and Dr. G. Lovell Gulland, Dr. John Orr, Dr. William Fordyce, Dr. Edwin Bramwell, and Dr. A. Fergus Hewat were elected to form the Council.

HOSPITAL MEMORIAL TO LORD BUCKLAND.—Part of the memorial of the town of Merthyr to the late Lord Buckland is to be an enlargement of the Merthyr General Hospital, which will be called "The Buckland Extension."

ROYAL INSTITUTE OF PUBLIC HEALTH.—The next Congress of the Institute will be held at Zürich during Whitsuntide, 1929, from Wednesday, May 15th, to Monday, the 20th, under the presidency of Lord Meston, Chancellor of the University of Aberdeen. The Congress will be conducted in English in the following sections: (1) State Medicine and Municipal and Social Hygiene; (2) Industrial Hygiene and Industrial Diseases; (3) Child Welfare, School Hygiene, and Women and Public Health; (4) Pathology, Bacteriology, and Biochemistry; (5) Tuberculosis; (6) Climatology and Sports Hygiene; and (7) Veterinary Medicine and Meat Hygiene. Arrangements for travel and hotels are in the hands of Sir Henry Lunn, 5, Endsleigh-gardens, Euston, London, W.C. 1, from whom particulars can be obtained.

NATIONAL UNIVERSITY OF IRELAND.—The Senate last week made certain appointments to the staff of University College, Dublin. To fill the vacancy in the chair of surgery left by the death of Mr. J. S. McArdle, Senator H. L. Barniville was appointed professor of surgery, and Mr. H. S. Meade, professor of regional surgery. In dividing the duties of the chair of surgery into two the Senate has followed the same precedent as in the appointments to the chairs of medicine and midwifery, both of which were vacant in the last few years.

Mr. Barniville was educated at University College, taking his degree in 1911 and proceeding to the M.Ch. Degree in 1916. He has been for many years one of the visiting surgeons to the Mater Misericordiæ Hospital, and has been a member of the Senate of the Irish Free State since its establishment in 1922.

Mr. Meade was educated at the Catholic University School of Medicine and obtained the licences of the Royal College of Physicians and Royal College of Surgeons in 1909, proceeding to the Fellowship of the latter body in 1910. During the war he served with the Royal Army Medical Corps and with the French Army Medical Service. He has been one of the visiting surgeons to St. Vincent's Hospital for several years.

At the same meeting of the Senate Dr. A. R. J. Dungan was appointed lecturer in medical jurisprudence in University College, Dublin.

FREEMASONS' HOSPITAL.—The board of management of the Freemasons' Hospital and Nursing Home have bought a site of three and a half acres at Ravenscourt Park, Hammersmith, for the erection of their new buildings.

INSTRUCTION FOR D.P.H.—A three months' course of lectures and demonstrations on Clinical Practice and in Hospital Administration will be given at the North-Eastern Hospital, St. Ann's-road, Tottenham, London, N., by Dr. F. H. Thomson, medical superintendent, on Mondays and Wednesdays, at 4.45 P.M. and alternate Saturdays at 11 A.M., beginning Monday, Jan. 7th, 1929.

ROYAL STATISTICAL SOCIETY.—At a meeting of this society, to be held in the Hall of the Royal Society of Arts, John-street, Adelphi, London, W.C., at 5.15 P.M. on Dec. 18th, Mr. H. E. Soper will read a paper on the Interpretation of Periodicity in Disease-Prevalence.

CHELSEA CLINICAL SOCIETY.—A meeting of this society will be held at the Hotel Rembrandt, Thurloe-place, London, S.W., on Tuesday, Dec. 18th, at 8.30 P.M., when Mr. J. E. R. McDonagh and Prof. Alexander Fleming will open a discussion on Antiseptics. The meeting will be preceded by dinner at 7.30.

SOCIETY FOR THE STUDY OF INEBRIETY.—The next meeting of this society will be held in the rooms of the Medical Society of London, 11, Chandos-street, Cavendish-square, London, W., on Tuesday, Jan. 8th, 1929, at 4 P.M., when Dr. Catherine Chisholm will open a discussion on Alcohol and Drug Addiction in Relation to Women and Children.

LONDON (R.F.H.) SCHOOL OF MEDICINE FOR WOMEN.—The annual dinner, held on Dec. 6th at the Savoy Hotel, was aptly described by the chairman, Prof. Winifred Cullis, as a family gathering to which certain privileged guests had been invited. The result was a large party, for something like 450 were present, showing that the privilege of an invitation was appreciated. The dinner, served at small round tables, was excellent and not too long, and this applies also to the speeches. The loyal toasts were honoured with especial fervour, since the chairman had called for an expression of sympathy with the Queen in her anxiety. Mr. John Buchan, in wishing prosperity to the school and hospital, said that his realisation of the value to the community of the work of doctors dated from the South African War, when he was in charge of concentration camps under Lord Milner. At this time also the beneficent activities of the committee of women workers, convened by Dame Millicent [illegible] in him a profound conviction of [illegible] walk of life in which she was given a quarter of a chance. The story of the school, he said eloquently, was one of courage, hard work, patience, optimism, and good sense, and its development was based on the only true equality—equality of competence. The chairman, in a graceful response, referred to changes in the staff during the past year, to the extensions in the hospital, and to the additional educational facilities provided, of which the most notable was the opportunity afforded for teaching in psychiatry at the Horton Mental Hospital at Epsom under Lieut.-Colonel J. R. Lord. The school had been successful in academic matters and in sport; and the entry of students had increased. In this connexion the chairman deprecated the closing to women of all but one of the other teaching hospitals of the University of London, not only because it was an unmerited slur on women medical students, but also because the fact that the prosperity of the London (R.F.H.) School of Medicine for Women had been maintained and increased in the face of competition had been a matter of legitimate pride. Lord Riddell, in proposing the health of the guests, found for each an apt descriptive phrase. Miss M. D. Brock, headmistress of the Mary Datchelor Girls' School, replied to this toast with a witty comparison between the attitude of the public towards school mistresses and towards women scientists. Major Ian Hay Beith, who also replied for the guests, referred, with legitimate sadness, to the monotony with which the public demanded eternally from a writer the kind of work which they had decided he ought to provide for them, and he described Mr. Buchan as the one living author who seemed able to compel the public to read what he chose to write and over a very large range of subjects. The guests included Dr. Andrew Balfour, Miss Lilian Baylis, Sir Walter Fletcher, Miss E. C. Higgins, Mr. Alfred Levy, and the Editors of the British Medical Journal and The Lancet. Lady Briscoe thanked Prof. Cullis for presiding, and the latter modestly disclaimed praise for the success of the dinner, which, she said, was entirely due to the labours of the honorary secretaries, Dr. Haldin Davis and Miss S. Widdows. In this spirit of great good humour the company adjourned to the dancing hall.

NEEDS OF THE LONDON HOSPITAL.—Presiding at the quarterly Court of Governors last week, Lord Knutsford reported that the quinquennial appeal had so far produced only the disappointing result of £112,000. The hospital, he said, is sorely in need of radium. A new children's department and a new heart department are also required.

AN EDINBURGH SUBSCRIBERS' LEAGUE.—At the annual meeting of the League of Subscribers to Edinburgh Royal Infirmary it was stated that the members now number 120,000, and that the amount raised during the year recently closed was £21,400. The membership includes the miners of Fifeshire and the Lothians.

DONATIONS AND BEQUESTS.—Sir William Berry and Sir Gomer Berry have made a joint gift of £20,000, payable over the next eight years, to the King Edward VII. Hospital, Windsor, in connexion with the special appeal for £55,000 for the rebuilding of the two wards recently destroyed by fire and the erection of a new nurses' hostel.—Mr. Robert Ottley, of Molyneux Park Hotel, Tunbridge Wells, left, among other bequests, £2000 to be divided between the Royal Infirmary, Manchester, and the London Hospital.—Mr. George Edward Skinner, Redland, Bristol, besides other bequests, left £1000 to Müller's Orphanage, Ashley Down, and £200 each to the Bristol Blind Asylum, the Bristol General Hospital, the Bristol Royal Infirmary, the Bristol Royal Hospital for Sick Children and Women, the Bristol Eye Hospital, and the residue of the property between ten charitable institutions.—Mr. William Taylor Hague, of the Hollies, Werneth, Oldham, left £3000 for such institutions or societies having for their object the relief of the sick or of poverty as the executor may think fit, and £1250 to the Oldham Royal Infirmary.

SEMAINE INTERNATIONALE DE LA LUMIÈRE.—Under this title a congress and exhibition, organised by L'Institut d'Actinologie de Paris, will be held in the Grand Palais, Paris, from July 22nd-27th, 1929, under the presidency of Prof. d'Arsonval. From the 22nd to the 24th there will be an international congress at which the subjects for discussion are: (1) the choice of a unit of measurement for ultra-violet rays used in medicine; (2) the treatment of tuberculous peritonitis by light; (3) the prophylactic value of ultra-violet rays; (4) the treatment of rheumatic conditions by infra-red rays; and (5) other current topics in actinotherapy. From the 22nd to the 27th there will be an international exhibition of apparatus and one dealing with heliotherapy from the earliest times. On the 25th and 26th conferences will be held on the recent progress of actinotherapy, and during the week an elementary course on this subject will be given by the Director of L'Institut d'Actinologie (Dr. Saidman) and his colleagues. Other fixtures include demonstrations and a reception. Further particulars may be had from Dr. W. Kerr Russell, 12, Park-crescent, Portland-place, London, W. 1, secretary of the British section.

THE M.A.B. AND THE LOCAL GOVERNMENT BILL.—At a meeting of the Metropolitan Asylums Board held on Dec. 8th it was decided to send to the Minister of Health an expression of regret that its representations had not succeeded in bringing about any modification of his proposals so far as they affect the Board. The Board adheres to the view it has previously expressed on the subject of the transference of its functions to the London County Council—namely, that its experience had shown that the management of the central public health institutions of London was a work of sufficient importance and extent to justify the existence of a central body endowed with statutory powers on which the bodies dealing with local affairs in London should be adequately represented. Since its inauguration in 1867 the Board has enlisted the services of a large number of men and women who have devoted themselves to the work of providing, maintaining, and extending where necessary the public hospitals required by London for infectious diseases and tuberculosis, mental hospitals ambulance and transport services, a training ship, and other lesser services. The whole of the debt of nearly £7,000,000 raised to meet capital expenditure on the erection, acquisition, and equipment of hospitals, &c., has been paid off with the exception of £336,000, representing the expenditure on grant-aided services of which the Government is responsible for one-half. The Board now has under its control some 25,000 hospital beds and in times of pressure employs a staff of 10,000 persons. The hardship felt by the Board at the transference of its duties is summed up in the following words: "The Board is to be involved in the changes through no shortcomings of its own. On the contrary, tribute has been paid by the Minister of Health and the London County Council to the efficiency of its organisation. Its duties have been steadily added to in recent years, and only this year Parliament has imposed upon it fresh and important responsibilities in connexion with the Metropolitan Common Poor Fund, and the Minister of Health has expressed his appreciation of the manner in which the Board has carried on this new work."

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
THURSDAY, Dec. 20th.—5 P.M.: DERMATOLOGY. (Cases at 4 P.M.)

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, Dec. 17th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.
WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.
THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.
FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY, Dec. 18th.—5 P.M., Dr. J. A. Drake: Urticaria.
THURSDAY.—5 P.M., Dr. I. Muende: Pathology Demonstration.

Appointments.

CARSON, F. S., M.D. Belf., D.P.H., has been appointed Admiralty Surgeon and Agent at Barrow-in-Furness.
HUNTER, A., B.Sc., M.B., Ch.B. Edin., Gardiner Professor of Physiological Chemistry in the University of Glasgow.
MAGUIRE, T. J. R., M.B., B.Ch. N.U.I., D.P.H., Assistant Medical Officer of Health, Co. Cork.
OVERTON, P. M., M.B., B.Ch. Leeds, Assistant Anæsthetist to Bolton Infirmary.
PARSONS, L. G., M.D., F.R.C.P. Lond., to the new Chair of Infant Hygiene and Diseases of Children in the University of Birmingham.
SCOTLAND, D. C., L.R.C.P. & S. Edin., L.R.F.P.S. Glasg., Certifying Surgeon under the Factory and Workshop Acts for Brighouse, West Riding.
STIRLING, J. A., M.B., B.S. Durh., M.O.H., Medical Officer of Health, Chesterfield.
WEIR, A. L., M.B., B.Ch. Belf., B.A.O., a Medical Referee under the Workmen's Compensation Act (Northern Ireland) for the County and City of Londonderry.
King's College Hospital: CRITCHLEY, M., M.D. Brist., M.R.C.P. Lond., Junior Neurologist and Lecturer in Neurology; BICKERTON, J. M., B.Ch. Camb., F.R.C.S. Eng., Supernumerary Junior Ophthalmic Surgeon and Ophthalmic Tutor; EAST, C. F. T., M.D. Oxf., F.R.C.P. Lond., Medical Tutor; EDWARDS, H. C., M.S. Lond., F.R.C.S. Eng., Surgical Tutor; SAUNDERS, R. M., M.B., Ch.B. Edin., Obstetric Tutor and Registrar; LUCAS, H. A., L.R.C.P. Lond., M.R.C.S., Pathological Tutor; NEWMAN, C. E., M.D. Camb., M.R.C.P. Lond., and SMITH, R. C., M.B., B.Ch. Camb., M.R.C.P. Lond., Medical Registrars; BELL, J. G. Y., M.B., B.S. Lond., and WOOD, H. L. C., M.B., B.S. Lond., Surgical Registrars; and CAWTHORNE, T. E., L.R.C.P. Lond., M.R.C.S., Registrar in the Ear, Nose and Throat Depts.

Vacancies.

For further information refer to the advertisement columns.

All Saints' Hospital for Genito-Urinary Diseases, 91, Finchley-road, N.W.—Sen. and Jun. H.S.'s. At rate of £200, £150, and £100 respectively.
Birmingham, Ear and Throat Hospital.—Second H.S. At rate of £150.
Birmingham, General Hospital.—Surg. Reg. Also Asst. Reg. Surg. O. At rate of £150 and £100 respectively.
Bootle Borough Hospital.—Hon. Radiologist.
Brighton, Royal Sussex County Hospital.—H.P. £150.
Bristol Royal Infirmary.—Hon. Asst. Surg. Also Hon. Anæsthetist.
Cambridge, Addenbrooke's Hospital.—Res. Anæsthetist. Also H.P. At rate of £180 and £130 respectively.
Central London Ophthalmic Hospital, Judd-street, St. Pancras, W.C.—Sen. and Jun. H.S.'s. At rate of £120 and £100 respectively.
Connaught Hospital, Walthamstow, E.—Hon. Surgeon.
Derby, Derbyshire Royal Infirmary.—Hon. Asst. Ophth. Surgeon.
Derbyshire Education Committee.—Asst. School M.O. £600.
East Ham Hospital, Shrewsbury-road, E.—Hon. P.'s and S.'s.
Exeter, Royal Devon and Exeter Hospital.—Sen. H.S. £200.
Freemasons Hospital and Nursing Home, 237, Fulham-road, Chelsea, S.W.—Res. M.O. At rate of £250.
Grocers' Company.—Research Scholarships. £300.
Guy's [illegible] hysician.
[illegible] of Medicine. £800.
Reg. £100; [illegible] *Paralysis, Maida Vale, W.*—Med.

Hospital for Sick Children, Great Ormond-street, W.C.—Surgeon.
Indian Medical Service.—Recruitment of European Officers.
Inverness, Northern Infirmary.—Hon. Surgeon for Ear, Throat and Nose.
Ipswich, East Suffolk and Ipswich Hospital.—H.S. £100.
Kensington, Fulham, and Chelsea General Hospital, 194, Finborough-road, Earl's Court, S.W.—Res. M.O. At rate of £100.
[illegible] *County Council.*—Asst. Tub. M.O. £600.
[illegible] *Hospital, Gt. Ormond-street, W.C.*—Three at £100.
Luton Borough.—Asst. M.O.H., &c. £600.
Manchester Babies Hospital.—Jun. Res. M.O. At rate of £50.
Manchester, Royal Infirmary, Central Branch, Roby-street.—Jun. H.S. At rate of £100.
Middlesex Hospital, W.—Jun. Res. Asst. Anæsthetist. At rate of £80.
Middlesex Hospital and Medical School, W.—Medical Registrarship. £300.
National Hospital, Queen-square, W.C.—Res. M.O. £200.
Plymouth City Mental Hospital, Blackadon, near Ivybridge.—Jun. Asst. M.O. £300.
Pontypridd Urban District Council.—M.O.H., &c. £800.
Poplar Hospital for Accidents, East India Dock-road, Poplar, E.—Second Res. O. £175.
Queen Mary's Hospital for the East End, E.—Res. M.O. At rate of £200. H.P. and Cas. O. At rate of £150. Also H.P. and H.S. Each at the rate of £120.
Reading, Royal Berkshire Hospital.—H.P., Second H.S. Also Cas. O. Each at rate of £150.
Royal Army Medical Corps.—Twenty-five Commissions.
Royal Free Hospital, Gray's Inn-road, W.C.—Clinical Assistants
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—H.P. At rate of £100.
St. Helens, County Borough.—Deputy M.O.H. £700.
St. Marylebone General Dispensary, 30, Marylebone-lane, Cavendish-square, W.—Physician for Infant Consultations.
[illegible] *W.*—Med. Supt. £400. Also Medical Surgeon. £1000.
[illegible] *tal for Women.*—Three Asst. H.S.'s. Each at rate of £100.
Sheffield, Royal Infirmary.—Jun. Aural and Ophthalmic H.S. At rate of £80. H.S. Also Asst. Cas. O. Each at rate of £80.
Shrewsbury, Royal Salop Infirmary.—H.P. At rate of £160.
Sutton, Surrey Downs Hospital for Children.—Jun. Asst. M.O. £500.
Talgarth, Breconshire, South Wales Sanatorium.—Two Asst. Res. M.O.'s. Each £250.
Truro, Royal Cornwall Infirmary.—H.S. £170.
University College Hospital, Gower-street, W.C.—Hon. Clin. Asst. in X Ray Dept.
University of London, South Kensington, S.W.—Geoffrey Duveen Travelling Studentship in Oto-Rhino-Laryngology. £450.
West African Medical Staff.—Vacancies for Pathologists in Nigeria and Sierra Leone. £800.
Willesden General Hospital, Harlesden-road, N.W.—Res. H.S. At rate of £100.
Winchester, Hampshire County Council.—Asst. County M.O. £600
Winchester, Royal Hampshire County Hospital.—Asst. Hon. Surgeon.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at S[illegible] (Derbyshire) Chelmsford (Essex), Crosby (Lancs.) [illegible] shire), Mossley (Lancs.), Kilbride (Derbyshire), and Hoylake (Cheshire).

Births, Marriages, and Deaths.

BIRTHS.

HAYDON.—On Dec. 5th, at Kingsdown, Bideford, N. Devon, the wife of L. R. Haydon, L.D.S. Eng., of a daughter.
MARSH.—On Dec. 3rd, at Wellington-road, Edgbaston, the wife of Frank Douglas Marsh, F.R.C.S., of a son.

MARRIAGES.

DAHNE—RANDALL.—On Dec. 3rd, at the Parish Church, Wimbledon, Dr. S. F. Logan Dahne to Mary Katharine, only daughter of Dr. and Mrs. Martin Randall, of Wimbledon.
LINDSAY—MARTIN.—On Dec. 6th, at the West London Synagogue, Sidney S. Lindsay, M.B., B.S. Lond., M.R.C.S., L.R.C.P., of 443, New Cross-road, to Ruth, only daughter of the late Robert J. Martin and Mrs. Martin, of 228, Haverstock-hill, N.W.3.
MORGAN—SMITH.—On Dec. 5th, at the Wesleyan Methodist Church, Crossgates, Leeds, George Morgan, F.R.C.S., to Ann, daugher of the late George Smith, of Cadney, Brigg, Lincs.

DEATHS.

BAKER.—On Dec. 2nd, at Devonport, after a brief illness, Thomas Baker, O.B.E., M.R.C.S., L.S.A., aged 76.
HALLIDAY.—On Nov. 21st, at his home, "Derry," Jamaica, B.W.I., Dr. Edward Vivian Halliday, aged 60.
PHILLIPS.—On Dec. 8th, at Queen's-road, N.W., Sir John Phillips, Kt., M.D., F.R.C.P., Honorary Physician to H.M. the Queen.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

NORTH KENSINGTON WOMEN'S WELFARE CENTRE.

THIS centre exists to give medical advice on birth control to those unable to afford the fees of a private medical practitioner. The advice is given by qualified medical women assisted by midwives. During the year ending July 31st, 1928, 1183 visits were paid to the clinic. Of these 351 were new patients, of whom 79 were sent by private doctors and welfare centres for medical reasons; 173 came on the recommendation of other patients. It is the policy of the clinic to discourage childless married women from making use of contraceptives unless they have good reasons for not wanting children, and, moreover, it is the custom to suggest the advisability of a second child. The fact that a perfectly safe and simple contraceptive has yet to be found and that too little is known of the effects of contraception are recognised at this clinic. The committee work in close coöperation with the Birth Control Investigation Committee, of which Sir Humphry Rolleston is chairman. It is hoped to secure over a long period of time some reliable data as to the prevalence, effectiveness, and after-effects of the use of contraceptives both as a whole and also in relation to the various methods employed.

In the copy of the fourth annual report of this centre which has reached us a medical supplement is inserted, wherein an attempt is made to answer the questions commonly asked by members of the profession visiting the clinic. The principle underlying the practice at this centre is to give the advice suited to the physical condition of each patient. A careful history is taken, and the patient examined both bimanually and with a speculum, in order that the most suitable contraceptive method for her may be ascertained. Some occlusive appliance as well as a spermaticide is always advised.

Occlusive Appliances.

The occlusive appliance most frequently recommended is some form of rubber cap to be worn by the woman. Three types are in use at the clinic:—

1. *The Dutch cap, made in 12 sizes,* is the one most frequently used. There are two classes of case in which it is unsuitable: (*a*) where the vaginal outlet has been so torn by childbirth that there is no sphincter action left; in these cases the cap will not stay in position; (*b*) cases of pronounced uterine prolapse.

2. *The Pro-Race cap* (three sizes) is designed to fit round the cervix itself. It is not suitable (1) in all pathological conditions of the cervical os; (2) when the intravaginal cervix is so short that there is not room for the cap to fit on; (3) for a patient with such short fingers, or such a long vagina, that she is unable to reach her cervix with her fingers.

3. *The Dumas cap* (three sizes) is useful for cases in which neither of the other two can be used. It fits up against the vault of the vagina, covering the cervix, and is unsuitable if (1) the cervix is long; (2) the tissues of the cervix are unhealthy.

Spermaticides.

The spermaticides employed are quinine, lactic acid, and vinegar.

Quinine in the form of the hypodermic tablet of quinine and urea hydrochloride (grs. 2) Parke Davis, is most often advised. This tablet is inserted above the cap, so that the cap holds it in position against the cervix. The cap and tablet are inserted when convenient and can be left in situ for 12 hours. No douching is necessary in this routine.

Lactic acid, made up into an ointment (3 per cent.) is advised, in conjunction with douching, in cases of excessive leucorrhœa. The routine in these cases consists in: (*a*) smearing the cap with ointment before inserting it, and (*b*) douching with 1 pint of warm soapy water before and after removing the cap. In no case should the cap be retained in the vagina for longer than 12 hours. Many women who live in overcrowded houses find it difficult to get the privacy and the opportunity to douche, and for this reason this technique is never advised unless there is, for other reasons, a need for douching.

In a certain number of cases (approximately 25 per cent.) both the quinine tablet and the lactic acid ointment are prescribed for use with the cap. These are cases where there is a certain amount of loss of tone in the vaginal walls and outlet, so that, although the cap does not slip out, it may alter its position slightly. Finally, in a small number of cases where it is impossible or inadvisable to fit the patient with a cap, a sheath is advocated for the husband's use, and a soluble pessary of quinine or lactic acid for the wife. Douching is optional in these cases. A cotton-wool tampon soaked in vinegar and water (half and half) and smeared all over with vaseline or any grease, is recommended

for those patients who cannot learn to adjust the cap correctly.

It is not claimed that these methods are perfect, but they can only be improved as knowledge increases.

Instructions to Patients.

After the patient has been fitted with a suitable cap, she is taught by the clinic nurse how to insert it within the vagina so that it covers the cervix. Great stress is laid upon the necessity of feeling the cervix through the cap, since if the cap is pushed into the anterior fornix the cervix is left exposed. The patient pays a second visit at the end of a week, when she is examined with the cap placed in position by herself. Further instruction is given if it is not adjusted correctly.

The examination made at the first visit is repeated at each subsequent six-monthly visit, and detailed notes are made. In this way any pathological condition requiring treatment can be detected, and the effect on the cervix of the use of rubber caps and spermaticides ascertained. It is the experience at this clinic that, with one possible exception, no ill-effects result from such use. Many patients speak of improved mental and physical health owing to the removal of the fear of pregnancy.

The patients advised to attend hospital for treatment include cases of the following: rectocele, cystocele (or both), erosion of cervix, retroversion of uterus, fibromyomata, and ovarian cyst. Private practitioners and official welfare centres are sending increasing numbers of patients. Among these are cases in which instruction in birth control is required on medical grounds, the Ministry of Health having approved that such cases should be referred to the clinic from the welfare centres.

It is of interest to note that the majority (over 80 per cent.) of patients attending the clinic during the last year have already practised some form of birth control—usually coitus interruptus. Satisfaction is expressed that these patients are now able to abandon a practice to which medical opinion is definitely opposed.

ENCEPHALITIS LETHARGICA IN IRELAND.

THE Department of Local Government and Public Health has issued a circular letter to all sanitary authorities in the Irish Free State, drawing their attention to the presence of encephalitis lethargica in several districts in Ireland, and suggesting that the disease should be added to the schedule of notifiable diseases. It is also suggested that cerebro-spinal meningitis and acute poliomyelitis should be added to the schedule in districts where this has not already been done. The circular states that "encephalitis lethargica or epidemic encephalitis is characterised by certain manifestations originating in the central nervous system. As in other general infectious diseases, the symptoms vary considerably in character and severity. In the abortive, mild, or transient type the symptoms are restricted to soreness of the throat, naso-pharyngeal catarrh, headache, vomiting, or diarrhœa, accompanied by slight pyrexia. In the severer forms of the disease, among those who survive the acute attack, many are later afflicted by motor disorders, characterised by rigidity and tremor, or by spasmodic movements and certain forms of paralysis and often by progressive lethargy and stupor. Various degrees of stupor have been noted. In the severest form of attack the patient is described as lying in bed like a log or resembling a waxen image in the lack of expression and of mobility. The prominent symptoms in a material proportion of recent cases have been lethargy and ocular paralyses, myoclonic movements, and sometimes twitching of the abdominal muscles. The disease attacks all ages with a preference for the early and middle periods of life and both sexes nearly equally. The disease appears to belong to that group of maladies (including also cerebro-spinal meningitis and acute poliomyelitis) in which the pathological agent is much more frequently present in the human organism than the clinical symptoms indicate. Although it is difficult to trace the infection from one person to another, it must be assumed that 'missed cases' and 'carriers' play a large part in the dissemination of these diseases."

THE HUMAN FLEA AND PLAGUE.

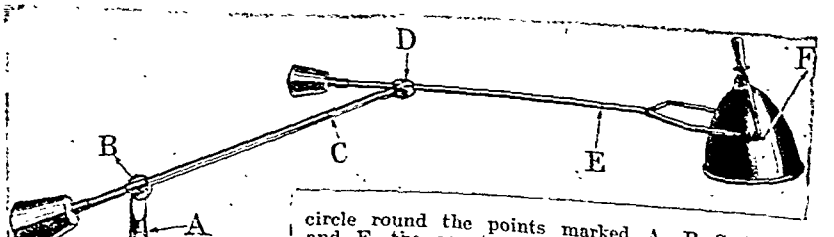
AT the end of July a mysterious disease was reported from the newly opened-up regions of Manchuria.[1] It raged among the Mongols, causing fever, vertigo, headache, occasionally diarrhœa, and often sudden death, and was not identified until a member of the Manchurian Plague Prevention Service arrived in the first week of September. He found plague bacilli in an inguinal bubo, and Dr. Wu Lien-Teh (known to many people in this country as W. L. Tuck) was sent up by the Marshal at Mukden. He found a curious state of affairs. Although medical practitioners were plentiful they had only the vaguest ideas of plague campaigns, and wasted much time and money in disinfecting rooms and clothing with carbolic acid while the sick and dying lay alone in the devastated villages where frightened police and coolies refused to go. The outbreak picked out a little village of 1800 inhabitants, and the history strongly suggests that it was brought there by a Mongol visitor who died in the local inn. One-fifth of the population of the village died and hundreds of inhabitants fled: fortunately Dr. Lien-Teh was able to check the widespread epidemic that the fugitives might have caused. He was fortunate in the enlightened coöperation of the Marshal and Civil Governor, who gave him the utmost support, both in money and in authority. His trained staff from Harbin set up a bacteriological laboratory in a goods office and plague vaccine was extensively used. About 8 per cent. of patients recovered. An interesting outcome of this campaign is the very strong impression conveyed to Dr. Lien-Teh from the clinical and laboratory work that *Pulex irritans* may—at any rate in Manchuria—convey the bacillus direct from patient to patient without the intervention of the rat.

SMALL-POX IN TIBET.

A TRAVELLER in Tibet has lately written some interesting notes[2] on the science of epidemiology as practised by its inhabitants. Small-pox infects large areas and is often extremely virulent, and its patients submit willingly to isolation and often notify themselves. The first treatment consists in the performance by the lama of the appropriate ceremonies, and if these fail the patient swallows suitably inscribed papers with the correct invocations. Should no good result follow, the lama applies exorcism, and if the patient dies he is buried, in contrast to the usual custom of cremation or exposure in the desert. Presumably, fuel being scarce, burial is performed to avoid infection. The custom of burning the dead man's skin rug, which Dr. Filchner once saw carried out, is another indication that the idea of infection is not unknown in those parts. An interesting observation he makes is that influenza and catarrh are practically unknown; they only appear when some white man opens a bale of cotton goods from Europe and releases the imprisoned bacteria.

THE "EVERYWAY" ELECTRIC LAMP.

AN electric lamp that can be put in any and every position, and will stay where it is put, should be a real boon in the consulting or operating room. Our illustration shows such a lamp. Each part of the apparatus will describe a complete



circle round the points marked A, B, C, D, E, and F, the counter weights holding the limbs in place at the required angle. There are no screws to undo or tighten: a touch of the hand is all that is necessary. The extension radius of the apparatus is 2 ft. 6 in. and the lamp will throw a light on any object within a circumference of 15 ft. The form illustrated can be stood on a table, a bench, or on the floor, and by means of the hollowed out base it can be hung on a nail or hook on the wall. Other patterns can be obtained for use as a reading lamp or as a standard lamp, the latter form being especially suitable for operations. The extension levers of the apparatus are nickel-plated, and the base is of wood laquered with a non-inflammable acid- and alcohol-resisting varnish. The lamp can be obtained from Messrs. Hawksley and Sons, Ltd., 83, Wigmore-street, London, W.1, and from other scientific instrument makers.

[1] North China Herald, Nov. 3rd, 1928.
[2] W. Filchner: Deut. Med. Woch., 1928, ii., 1897.

HUMAN FITNESS FOR INDUSTRY.

Two small volumes have just been issued, the titles of which might easily have been interchanged. One is by a physiologist,[1] the other by a psychologist,[2] and each reviews from a different angle the facts disclosed in recent years, mainly through the activities and publications of the Industrial Fatigue Research Board. The one shows *how* the human organism reacts to the milieu of modern industry; the other describes *why* it so reacts. Life to-day, in comparison with 200 years ago, is happier and healthier, because, by lightening human toil through the use of power-driven machinery, we are ever more and more shaping our environment to suit our requirements. But the way in which the means to this end, the new mills of industry and the old human factor, are acting and reacting each on the other is a fascinating study. It is the study of industrial fatigue, which has now passed through an experimental period during which it was far more talked about than understood, and has settled to the stage of painstaking observation and experiment—a stage wearisome to the public but entrancing to the worker. Now and again a report of solid worth, though not easy to read, discloses some new fact or facts. But the additions to the edifice which is being built out of our knowledge concerning human capacity are apt to escape notice. Prof. E. P. Cathcart embodies in his small book lectures given to engineering students—potential works' managers. Herein is clearly explained the practical bearing upon workshop practice of the new knowledge. The physiology of activity is described and of fatigue and monotony. The possibilities of alleviating fatigue, by suiting hours of labour to the requisite physical effort, by fitting the worker to his work, and by the adoption of more convenient methods are explored. The way in which the environment affects working capacity through the influence of ventilation, heating, humidity, lighting, noise, sitting accommodation, and design of machinery is clearly set out. Prof. Pear has been less successful. He seems possessed with the idea that modern industry is some demon specially devised for mangling the mind of man. He shows little appreciation of the advances of recent years and of occupational life as it was lived in pre-machine days. M. C. Buer, in a survey of Health, Wealth, and Population in the Early Part of the Industrial Revolution, has described it as life in overcrowded and soul-destroying hovels, where monotony, if it only meant freedom from the irritation of sickness, was a glorious relief from that bodily pain and ill-health which ended the life of the manual worker at 45. Prof. Pear does not supply practical wisdom which may be put to everyday use, but looks for motives behind action. A chapter dealing with the psychology of laziness makes good reading; it tells clearly how we may react mentally to disagreeable chores, but hardly give sufficient weight to the possibility that Willie's weariness may depend upon endocrine deficiency. This work does not lead us much further.

MEDICAL EDUCATION.

THE Rockefeller Foundation continues to issue its useful and interesting accounts of the equipments and methods in use in teaching medicine and the medical sciences in various parts of the world. The tenth series[3] contains 33 well-illustrated articles covering a range from Singapore to Chile; three of them are on medical libraries and how to use them. Every teacher who has done it knows the advantage of going about and seeing other institutions than his own and other methods of instruction, and if he cannot go in person to the institute of physiology and general pathology at Debreczen or the institute for nutrition at Tokyo, he will get some useful hints on what to do and what not to do by reading about them. The schools of pathology, bacteriology, and physiology in the University of Leeds and the courses of instruction given in them are described in this volume by Prof. M. J. Stewart and Prof. B. A. McSwiney, and there is a useful account of the demonstration of biological experiments by optical projection methods by Dr. M. S. Biskind, of the Western Reserve University.

M.D. writes: I have the misfortune to suffer from a chronic osteitis of the lumbar vertebræ and right os innominatum, entailing much pain, which especially in later months has yielded in wonderful manner to the exhibition of aspirin. I should be much obliged if any of my colleagues would give me their views as to deleterious effects likely to follow on taking about grs. 30 daily. I have taken that amount for about one and a half years, so far as I can tell without harm.

[1] The Human Factor in Industry. By E. P. Cathcart, C.B.E., M.D., F.R.S., Gardiner Professor of Chemical Physiology, University of Glasgow. London: Humphrey Milford, Oxford University Press. 1928. Pp. 105. 5s.

[2] Fitness for Work. By T. H. Pear, M.A., B.Sc., Professor of Psychology, Manchester. London: University of London Press. 1928. Pp. 151. 5s.

[3] Methods and Problems of Medical Education. Tenth series. Rockefeller Foundation. 1928.

THE KING'S ILLNESS.

OFFICIAL BULLETINS.

(*Continued from p. 1222.*)

THE following is the text of the official bulletins which have been issued during the King's illness by Sir Stanley Hewett and Lord Dawson.

THURSDAY, DEC. 6TH. 10.45 A.M.

The King has passed a fair night and the temperature this morning is lower. The general condition is slowly improving and the infective process, which remains severe, is becoming more localised.

8.20 P.M. The King's general condition remains the same as that reported in this morning's bulletin. The localisation of the infection at the base of the right side of the chest is rather more defined, which conforms to the progress of the illness during the last two days. (Signed also by Sir Farquhar Buzzard and Sir Humphry Rolleston.)

FRIDAY, DEC. 7TH. 11.30 A.M.

The King has had some restful sleep and his general strength is maintained. Further investigation of the right side of the chest will be undertaken during the day.

8.15 P.M. His Majesty has not had a restful day. A radiological examination was carried out this afternoon. Neither this nor exploration by aspiration previously carried out, has disclosed any appreciable amount of pleural effusion. The general condition remains unchanged. (Signed also by Dr. H. Graham Hodgson.)

SATURDAY, DEC. 8TH. 11.15 A.M.

The King has had some hours of sleep. The temperature is still raised on account of the local lung condition. The general condition is the same.

8.15 P.M. The King has passed a quiet day with sleep. The raised temperature persists, but the inflammation of the lung must of necessity lag in its progress towards repair. (Signed also by H. Graham Hodgson, Sir Humphry Rolleston and Sir Farquhar Buzzard).

SUNDAY, DEC. 9TH. 11.45 A.M.

The King has had several hours' sleep. The prolongation of the fever is having the inevitable effect of producing a certain measure of exhaustion. The pulse, however, remains steady.

8.30 P.M. The King has passed a quiet day, but there is no diminution in the exhaustion referred to in this morning's bulletin. The pulse remains steady.

MONDAY, DEC. 10TH. 11.30 A.M.

Although the King has passed a disturbed night there has been some fall in the temperature this morning and there is also a slight improvement in the general condition. Anxiety, however, must continue.

8.45 P.M. His Majesty the King has had a quiet day. The signs in the lung have improved. The fever persists, though it is not so high as last evening. This is due to some return of the general infection, which necessarily affects the condition of the heart. (Signed also by Sir Farquhar Buzzard and Sir Humphry Rolleston.)

TUESDAY, DEC. 11TH. 11.15 A.M.

His Majesty the King has had several hours' sleep. The temperature remains high, but there is no further impairment of strength.

8.30 P.M. His Majesty the King has had a quiet day. There is no increase in the exhaustion, and the pulse remains steady.

WEDNESDAY, DEC. 12TH. 10.30 A.M.

The King has had some hours' sleep. The slight improvement noted late last night is maintained, the temperature being somewhat lower and the general condition a little better.

4 P.M. (about). The slight improvement in the King's condition noted this morning is maintained. A purulent fluid round the base of the right lung has been removed by puncture this morning, and further drainage will be necessary. (Signed also by Sir L. E. H. Whitby, Sir Farquhar Buzzard and Sir Humphry Rolleston.)

8.30 P.M. An operation on the King for the drainage of the right side of the chest has been successfully performed this evening. The condition of His Majesty is satisfactory. (Signed also by Sir Hugh Lett, Dr. Francis Shipway, Sir Farquhar Buzzard and Sir Humphry Rolleston.)

Oliver-Sharpey Lectures

ON AN EXPERIMENTAL STUDY OF CERTAIN VISCERAL SENSATIONS.

Delivered before the Royal College of Physicians of London

BY E. P. POULTON, D.M. OXF.,
FELLOW OF THE COLLEGE AND PHYSICIAN TO GUY'S HOSPITAL.

LECTURE II.*

Delivered on May 3rd, 1928.

CUTANEOUS ŒSOPHAGEAL REFLEXES AND COUNTER-IRRITATION.

HAVING dealt in the first lecture with the physiological mechanisms by which pain is produced, it is of interest to consider next how these may be affected by cutaneous stimulation, especially as counter-irritation has been employed from time immemorial in the relief of internal pain. The type of stimulation that Payne and I used[34] consisted in applying a turpentine stupe or mustard leaf plaster over the sternum, or rubbing with a pungent liniment such as lin. camph. ammon. B.P., or rubbing the skin with cotton-wool, a dry sponge, or the bare hand; but the actual method of stimulation does not appear to be important, since as marked results were obtained when the sternum was rubbed with cotton-wool or the bare hand as when a pungent liniment or a turpentine stupe was applied. At first bags were used which contained 10–30 c.cm. of air, amounts sufficient in some cases to produce vigorous activity on the part of the œsophagus, but not enough to cause actual pain. We found that the œsophagus became more active when the subject did the rubbing himself, and once or twice when the attention wandered and the experiment was forgotten rather unusual activity was also noticed. Increased activity was indicated by increased frequency and height of contraction and by a simultaneous rise in tonus, while with great activity large multiple contractions were seen.

The activity of the œsophagus depended to some extent on its activity immediately preceding the experiment. When the œsophagus was quiet, as was usually the case when there was but little air in the bag, stimulation caused immediate activity which tended to die down after stimulation or during the stimulation itself if this was prolonged. There was nothing specific in the type of activity caused by rubbing. In fact, a tracing might be obtained showing activity similar in all respects to what had been observed previously and for which there was no obvious cause.

When the œsophagus was already active stimulation sometimes caused a decrease in its activity. At other times the activity might remain unaltered and the type of contraction alone might be changed, but in this case the stimulation usually caused the activity to disappear in the end. In three out of the 17 experiments there was no obvious change in the tracing.

The effect of rubbing over the sternum in the case of a medical student inclined to attacks of indigestion is shown in Fig. 9 (A). The bag only contained 15 c.cm. but the œsophagus was rather active, since he had just been through an experiment with 40 c.cm. in the bag. The effect of rubbing was to cause a decrease in activity, so that only respiratory variations were shown. A wave was seen immediately the rubbing was stopped, which is rather a common occurrence; but otherwise the œsophagus remained absolutely quiet. Fig. 10 shows the effect of rubbing in my own case, when a bag in the lower œsophagus contained 30 c.cm. air. This was enough to produce considerable activity though *no pain*, and the movements of the œsophagus shown in the first part of the tracing resemble those of the same subject in Fig. 1. Rubbing took place between the arrows, and was sufficiently severe to cause tingling between x and x. The effect of the rubbing was to change a fairly uniform tracing into one showing marked periodicity, so that it resembled to some extent that of an irregular Cheyne-Stokes breathing. After successive periods of waxing and waning there were no œsophageal movements at all for a period of 39 sec. Then movement began again, accompanied by a slight recrudescence of the tingling at x.

The same kind of result was obtained during proper counter-irritation—i.e., when the bag contained enough air to cause pain. Such a tracing in my own case is shown in Fig. 9 (B) with 40 c.cm. in the bag and with its end 12 inches below the teeth. Rubbing for 98 sec. took place between the arrows. Continuous retrosternal pain was felt before rubbing, and this disappeared during the rubbing and for some time afterwards; in fact, the rubbing felt "comforting." In this case the first effect of rubbing was to cause waning of the movements followed by a large multiple contraction, then a further diminution; but the interesting point about this tracing was that the diastolic pressure definitely fell. Thus before rubbing the lowest pressure was 20 cm. At the first period of waning it was 18 cm.; but the lowest value—viz., 13·5 cm.—was reached a few seconds after the rubbing was ended. As in Fig. 10, there was a completely quiescent period, in this case of 29 sec.

The fall of diastolic pressure and consequently of tonus provides the obvious explanation why rubbing made the pain less, since it means that the posture of the œsophagus had temporarily increased, and the tension on the pain-endings had fallen; but the other method of relieving pain is also shown in Fig. 9 (B), since there was an increase in the number of the contractions between the periods of waning, so that during this phase, too, the pain was less because the contracting muscle itself bore the strain instead of the pain-endings. This factor is exemplified in the large multiple contraction that occurred toward the end of rubbing, and the numerous small contractions after the rubbing was over. Hence it would appear that the pain is relieved by rubbing because the latter tends to produce an irregular Cheyne-Stokes-like type of rhythm. However, Fig. 9 (C) shows an experiment on myself where rubbing, again shown between the arrows, produced no lessening of the activity at all. In fact, the œsophagus became more active during rubbing, while the end of the tracing was very similar to the beginning. Pain is shown by descent of the lever, and during the activity the pain is obviously less, and particularly so during the rubbing; but pain came back immediately afterwards, because presumably the usual fall in tonus which, when present, persists for some time after the counter-irritation failed to appear.

What was the reason of this failure? It would appear to be due to the previous activity of the œsophagus. Thus in Fig. 9 (C), where the diastolic pressure actually rose, observations on the œsophagus had been carried out for 29 min. continuously before the counter-irritation experiment was undertaken. It has already been pointed out that the œsophagus tends to adapt itself to the presence of a bag by increasing its posture, and if at the end of the 29 min. stimulation by a bag the posture has reached its maximum value it is clear that no further increase can take place with rubbing. In Fig. 9 (B) the counter-irritation took place after the bag had been in situ for only 7 min., and it is interesting to note that when this experiment was repeated 15 to 20 min. later the fall of diastolic pressure was only 1·3 cm. instead of 6·5 shown in Fig. 9 (B).

In all we carried out seven experiments on counter-irritation which were successful in relieving pain. It was found that in five there was a fall in diastolic pressure, while in four there was some time or other an increase in the contractions. However, in one experiment neither of these features was present, so that our theory does not provide a complete explanation

* Lecture I. appeared in THE LANCET of Dec. 15th.

of relief of pain by counter-irritation, nor does it explain why it occurred at the beginning of counter-irritation before the fall in diastolic pressure had time to take place. There must be a third factor, and this is probably psychological. The mere sensa-

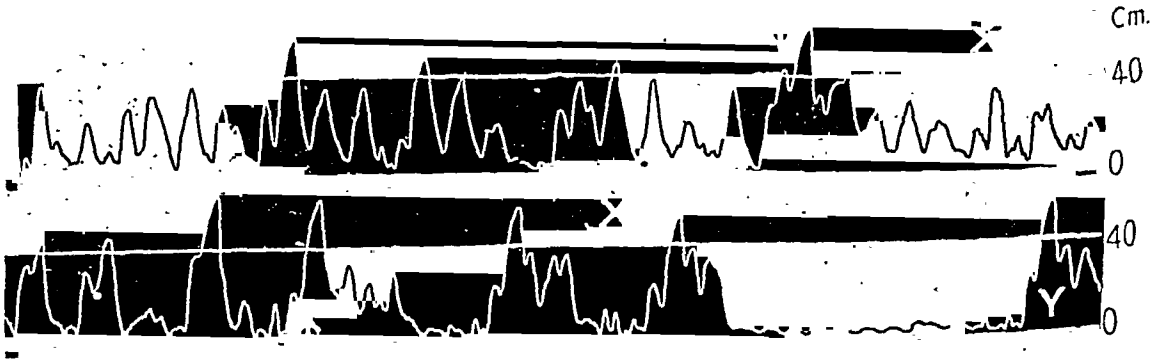
FIG. 9.

Œsophageal tracings in three experiments. Horizontal lines 0 and 40 cm. Rubbing over sternum between the arrows. Descent of lever indicates pain.

tion of the skin being rubbed hard by a muscular hand must divert the attention from the œsophageal pain felt deeply to the sensations felt on the skin itself, and so consciousness of the deep pain would be lost.

But it is not necessary to confine the rubbing to the overlying skin in order to obtain an effect on the œsophagus. In a number of experiments the skin was rubbed at a distance, and in Fig. 11, with 10 c.cm. air in the bag and W. W. P. the subject, rubbing the right calf with cotton-wool caused immediate activity with a slight increase of diastolic pressure to begin

FIG. 10.



with, while during the rubbing the bag produced a noticeable sensation in the throat.

When the skin over the sternum is rubbed activity of the œsophagus takes place presumably from reflex action; but is the effect on the œsophagus of rubbing the calf of the leg also an example of a reflex from a distance? Probably more than a mere reflex is involved, particularly when the rubbing is prolonged. Thus my colleague, W. W. P., has pointed out, what must be a familar fact to many, that the violent scratching of an urticarial wheal, for example, may after the local itching has stopped, produce an increase of pulse-rate, feeling of exhaustion and dizziness in the head, breathlessness, with a sinking feeling in the stomach—various symptoms which can be explained if a considerable dose of a histamine-like substance has been liberated into the system by the rubbing.

Our experiments on counter-irritation suggest a comparison with the mass reflex described by Head and Riddoch[35] in patients with complete division of the spinal cord in the dorsal region in whom rubbing the skin of the lower limbs caused evacuation of the bladder with forced movements of the legs, &c. Danielopolu, Radovici, and Carniol[36] have published tracings of large single contractions of the bladder which followed stimulation of the skin in a patient suffering from spastic paraplegia due to syphilitic disease of the spinal cord. From our experiments on normals it is clear that the results are not so stereotyped as in the mass reflex, since they depend on such conditions as attention, length of previous stimulation, &c. The main difference, however, would appear to be that in the normal cutaneous stimulation does not invariably cause a big single contraction. Very often there is an increase of the small contractions with rise of systolic and diastolic pressure, whereas where the tonus is high enough to cause pain we get this curious Cheyne-Stokes-like activity that has already been described.

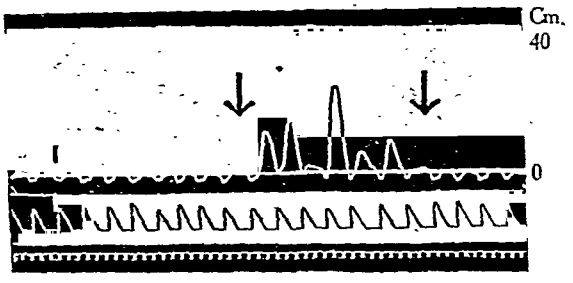
SENSATION OF NAUSEA.

It is curious that on questioning various people there should be no very decided agreement as to exactly what sensation the term nausea or feeling of sickness should be applied. I asked one of my sons aged 9, where it was he felt sick, and he replied at once "in my throat"; and to Payne and myself this sensation felt in the back and lower part of the throat is so characteristic and localised that we have limited the term nausea to it. It is true that this sensation is often associated with a feeling in the pit of the stomach to which the term "sensation of sinking" or "emptiness" may be given, or with a frontal headache or with globus; but in any investigation of the subject it is essential to be precise as to the locality as well as to the quality of any particular sensation that I have stressed the actual connotation of these various terms in these lectures.

Our earliest investigations of nausea came about rather by chance. An experiment had been carried out on myself in which a bag containing 40 c.cm. of

air had been kept in the œsophagus for six minutes and had eventually caused much retching and been vomited. The bag was swallowed again and the volume of air was gradually increased from 10 c.cm. up to 30 c.cm. The activity, as shown in Fig. 12 (A), was moderate and alternated with periods of complete quiet. During one of the periods of activity a sensation of nausea lasting not much more than one second was signalled repeatedly, and was found to occur

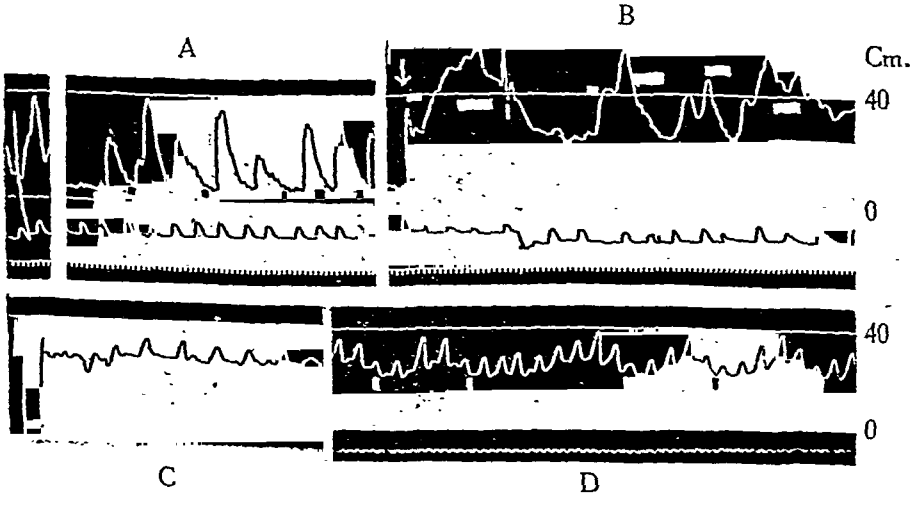
FIG. 11.



during the relaxation phase of one of these peristaltic contractions, as shown by the white rectangles beneath the tracing. The air in the bag was then suddenly increased up to 40 c.cm., as shown in Fig. 12 (B). Both nausea, shown by the rectangles above the tracing, and pain in the throat, shown by the rectangles below the tracing, were signalled. The subject noted that there was a gradual transition of the sensation from nausea through a painful nausea to pain in the throat alone so that the sensations were really mixed, nausea or pain predominating as the case might be. Eventually pain in the throat was felt alone, though it proved rather difficult to determine the exact spot at which the element of nausea in the sensation had come to an end. Three minutes later the pain in the throat disappeared and pain behind the sternum was felt alone; but there was no obvious alteration in the tracing at this time. A patient once described this throat pain to me as rasping, which I think is an apt simile. The appearance of nausea during peristaltic relaxation would suggest that the mechanism of its production is essentially the same as that of visceral pain, but that there is some specific sense organ that reacts to a lower degree of tension than the pain-fibres, and occasionally both may be stimulated at the same time; but eventually, as elsewhere, pain is the over-riding sensation. The relation of nausea to pain in the throat is thus similar to the relation of touch to pin-prick on the skin, or of pressure to painful pressure on skeletal muscle. There is another point of interest. The sensations of nausea and pain in the throat in this experiment must have been sensations referred from the œsophageal excitation, for the bag was a good deal below the position where the sensation was felt. In fact, it would have been impossible to have retained it in the throat. We did find that the sensation of nausea was more readily produced the higher the bag was situated in the œsophagus. In this connexion it is interesting that Boring[23] found that œsophageal stimulation tended to cause sensory effects at particular places, and he noted in one case that there was no visceral sensation between the upper part of the sternum and the throat; it was from the point of view of internal sensation, as if the neck was missing. No doubt people vary, since a medical student (N. I. K.), examined by Ride and myself, noticed nausea as low as the thyroid.

The sensation of nausea in our experiments was also described as a sensation of sinking in the throat, and if it is due to a slight tension exerted on specific end-organs in the œsophagus, it is to be expected that other means of producing this increase will also elicit the sensation. In this connexion I have a vivid recollection, while standing on board ship during a rough channel crossing, of feeling nausea at each descent of the ship while it disappeared completely during the ascent. I did not at the time analyse my feelings sufficiently in detail to determine the exact moment during the descent at which the sensation was felt; but Dr. G. H. Oriel informs me, both from his experience of transatlantic liners and of American elevators, that it is during the retardation towards the bottom of the descent that the sensation is experienced. This fits in quite well with the views just described, because the effect of this retardation on the elastic œsophagus which is suspended on a rigid framework—viz., the skull and vertebral column and bones of the lower limbs—would be to increase its tension in a longitudinal direction. A similar increase of tension would occur during the acceleration upwards at the beginning of the ascent, and I am informed that according to experience in quick lifts the ascent is a more potent cause of sickness than the descent. It should be mentioned that a peculiar sensation is often observed during the acceleration at the beginning of the descent as if the viscera were being left behind up above; but Dr. Oriel is convinced that this sensation is not the same thing as nausea.

FIG. 12.



SENSATION OF SINKING OR EMPTINESS.

This was investigated by means of a rubber catheter which was passed into the cardiac end of the stomach and connected with a bellows so that air could be forced in rapidly. A rubber bag was also introduced into the stomach, and Fig. 12 (C D) gives the tracing from the bag. Between C and D 200 c.cm. were introduced into the stomach, and the effect was to produce a slight periodic rise and fall in the tracing, while the sensation of sinking of less than a second's duration is again recorded during the relaxation, but very near the lowest part of the tracing. At the

same time the subject, W. W. P., felt what he at first described as a desire to eructate. The feeling was as if there was some wind there which might come up, although it did not. Further analysis of the sensation leaves no doubt that it was felt behind the upper end of the sternum, and that it was identical with what has commonly received the appellation of "sensation of globus."

The rise and fall of the lever had quite a short periodicity, the intervals varying from 9 to 25 sec. with an average of 16. The time intervals were much too short for these changes to be considered as tonus variations. They must have been gastric peristalses, which might have originated in the cardiac part of the stomach, or perhaps were due to peristalsis occurring lower down, the pressure effects being conducted to the cardiac end of the stomach. At any rate, it is clear that the sinking sensation falls into line with that of nausea, and again may be considered as due to a slight rise of tonus, of the stomach wall this time, sufficient to cause tension on specific nerve end-organs, but not enough to cause pain. As is the case with nausea, the peristaltic contraction causes the disappearance of the sensation. It might be argued from Fig. 12 (D) that actually there was no increase of tonus, since the diastolic pressure was actually lower than before the air was introduced. However, the mere introduction of air with the consequent increase in the diameter of the stomach will itself increase the tonus, even though the pressure may fall. This is shown by the formula $T=pr$. In other instances where sinking was signalled the diastolic pressure was increased.

There are two observations which have a bearing on this question of the sensation of sinking. My colleague, W. W. P., has noticed that the sensation may be diminished by standing upright with the abdominal muscles braced. This would increase the intra-abdominal pressure and support the stomach wall, reducing the stretch by neutralising the intragastric pressure. A. E. Barclay[37] has made an observation in the opposite sense, since he found that the normal stomach may drop an inch or more when the patient smelt something which to him was nauseating, such as asafœtida. This sudden dropping must, I consider, be due to the abdominal wall being suddenly relaxed, and the result would be an increased tension on the structures in the stomach wall, which would cause the sensation of sinking. Evidently the relaxation of the abdominal wall may be so great that the venous return from the abdomen may be interfered with, since Barclay has observed that the patient has fainted a few seconds after the lower border of the stomach dropped by several inches.

The sensation of globus is a feeling of a lump which is often felt in the mid-line about the level of the clavicle, but my colleague has noted a similar sensation lower down behind the xiphisternum, particularly after a big dinner which "lies heavily on the chest." In our experiments globus has been frequently produced at the same time as the sensation of sinking, and the following experiment illustrates its production reflexly. In this case the catheter was passed into the stomach, while the bag to act as an indicator was placed in the lower part of the œsophagus, with its end about 15½ inches below the teeth. At first a level tracing was obtained showing respiratory waves and one rather larger wave which was probably a local contraction. Then 600 c.cm. of air was introduced through the catheter into the stomach, as described in the last experiment, which had been carried out just previously. The result was to cause a series of large contractions to pass down the œsophagus due to secondary peristalsis. The sensations of sinking and of globus were felt and recorded near the bottom of the depressions between the contractions. Hence the result of blowing up the stomach was not only to cause contractions in this organ, but reflexly to produce simultaneous contractions in the œsophagus, since in both experiments the sensations of sinking and of globus were recorded between the contractions, and near the lowest points of the tracings. My colleague finds that in naturally occurring globus sensations an increase takes place during a deep inspiration, which would tend still more to stretch the œsophageal wall.

We have already given the name "gastro-œsophageal anti-regurgitation reflex" to the effect on the œsophagus of blowing up the stomach; but we have now found that it varies according to the condition of the œsophagus at the time it is elicited. In one experiment a catheter led to the stomach while the indicator bag in the œsophagus at first contained 50 c.cm. of air, enough to produce continuous pain and to prevent any contractions at all getting past the bag. The amount was then reduced and the first part of the tracing showed a continuous series of large contractions with pain felt during each relaxation. Then 600 c.cm. of air were forced into the stomach. This caused a complete upset in the rhythm of the œsophagus with disappearance of the large contractions, and there was also an immediate relief from the œsophageal pain. What happened was that the sudden increase of tension on the nerve-endings during muscular relaxation disappeared, and the steady tension during diastole which now remained was itself not enough to affect consciousness. This is, I think, a more likely explanation than that suggested previously[34] for the relief of pain in this type of experiment.

From the psychological point of view it is interesting to note that our experiments have suggested a specific type of sensation in three different parts of the upper alimentary tract. There is nausea felt in the throat, there is globus which is felt situated deeply at various levels behind the sternum, and there is a sinking or empty sensation felt in the epigastrium and due to the stomach. There are presumably special end-organs for these sensations; but as the stimulus increases these sensations give place to pain at all points.

The relation between these various sensations is well illustrated by a recent experience of my colleague W. W. P. He had a severe attack of indigestion after eating gooseberry tart at night. During the worst part of the attack there was a fairly intense "burning" sensation located very definitely at the level of the clavicles, relieved by swallowing. During spontaneous remissions the pain was sometimes replaced by a "globus" sensation. During the worst parts of the bout there was, in addition, at the xiphisternal level a griping pain resembling in quality abdominal colic. It was sometimes brought on and was always intensified by swallowing. This latter pain was very like that caused by the incompressible bag described in the last lecture, and presumably indicated an area of high tonus which acted as an obstacle to the progress of the œsophageal peristaltic wave. The pain had such a colicky character that he thought at first it was abdominal colic until he considered the position which was clearly at the lower end of the œsophagus. This was confirmed later in the attack by the arrival of true colic pains with the typical mid-abdominal location.

These observations bear out a point I have emphasised on several occasions since our experimental work was carried out. The simplest way of diagnosing a sensation as œsophageal is to ask the patient to swallow. If the sensation is very slight it may be momentarily intensified, due to the tension on the nerve-endings in the wake of the peristaltic wave. If the pain is continuous and of moderate severity, the effect of swallowing will be to relieve it, as the peristaltic wave passes by and the part of the wall giving rise to the sensation becomes constricted. If, on the other hand, the pain is severe, the tone may be so high that the peristalsis is held up in its course. Swallowing will then produce a painful sensation of maximal intensity. As far as diagnosis is concerned the point is that swallowing always produces a change in an œsophageal sensation.

So far I have not mentioned the sensation of fullness which has bulked far more largely in the literature

than the sensation of sinking or emptiness. Curiously enough, W. W. P. and a student recently examined both experienced sinking and not fullness when air was blown into the stomach. Undoubtedly fullness does exist as a separate sensation, though possibly the two may not have been clearly differentiated in the description of gastric symptoms. If, as we maintain, sinking is due to a slight tension on specific nerve-endings of the stomach, then it would be surprising that fullness should be due to the same thing. Becher[36] suggested that gastric sensations were not due to the stomach, but to stretching of the abdominal wall, and he produced some evidence in favour of this. I suggest that Becher's explanation may account for the sensation of fullness, but that sinking is a purely gastric sensation.

Vomiting that so often terminates the sensations of a dyspeptic attack is due primarily to reflex contractions of the abdominal wall, though an observation of Ryle's shows that the stomach also plays a part.[39] Barclay[37] found that if the lesser curvature of the stomach was stimulated by electricity the abdominal muscles contracted, while the stomach remained stationary. Vomiting is not necessarily a painful process, as I can testify myself, when a bag was irresistibly pushed out of the œsophagus by an abdominal contraction without any sensation at all. On the other hand, I received one night a vivid impression how extremely painful vomiting may be. It was during an attack of acute dyspepsia from bad food, and the pain, which coincided with the abdominal contractions, was situated in the region of the xiphisternum, and was probably caused by the *contents of the stomach* being forced out through a closed cardia.

SEA-SICKNESS.

I am now in a position to put forward for your consideration what I hope may be regarded as a reasonable theory of sea-sickness, which rests partly on the work already described and partly on investigations by Dr. G. H. Oriel[40] recorded in THE LANCET, when he was surgeon to the Canadian Pacific steamships. His investigations have been on the biochemical changes that occur in this condition. Put shortly, they are that on comparing a normal day for the subject under investigation with a day at sea at the commencement of a storm there is on the latter day oliguria, an increase in the percentage of ammonia in the urine for each hour; ketone bodies appear in the urine, while the acidity—i.e., the hydrogen-ion concentration of the urine—is diminished, and the blood-sugar falls. All these results are observed *before* the onset of vomiting. From our present point of view the significant observation is that nausea is about the earliest manifestation of all, and on the day in question (Table I.) nausea was felt from 8 A.M. to 9 A.M. immediately on waking, while ketosis first occurred in the urine from 9–10 A.M. It is true that the percentage of ammonia in the urine passed at 8 A.M. was increased, but with the subject asleep it is impossible to say anything about the nausea at this time. On another occasion (Table VII.) he informs me that nausea was experienced from 1 to 4 P.M., while these biochemical changes were first noticed at 4 P.M.

We have seen that nausea may be produced by a sudden tension on specific end-organs in the œsophagus brought about by the retardation during the latter part of the descent of the ship, and the sensation of sinking in the stomach is presumably brought about similarly. I cannot say whether the acceleration which occurs at the beginning of the ascent is also a factor; Oriel informs me that the ship often hits a wave and there is a sudden jerk. On the theory here presented the nausea and sinking are the primary cause of sea-sickness, and these sensations act by reflexly inhibiting the normal movements of the alimentary canal with stasis of its contents. This is proved by Oriel's experience. For instance, a subject who took an ordinary lunch at 1 P.M. went to sleep between 2 and 4 P.M.; he then woke up with a headache, nausea, and ketosis, and with no desire to take tea; he finally vomited up his lunch at 7 P.M., a 6-hour delay. Again, Oriel has found that his breakfast has reappeared at night, a 10–12 hours' delay. I think it is possible to explain the biochemical changes as the direct result of this stasis, since this would entail failure of absorption in the small intestine, and consequently carbohydrate starvation, hypoglycæmia, and ketosis. The hypoglycæmia and ketosis would probably increase the response of the œsophagus and stomach to the movement of the ship. Though proof of this is lacking, it is at least suggestive that sea-sickness occurs more readily on an empty stomach, and the sensations of nausea and sinking are closely related to, and often associated with, hunger. A vicious circle is thus established—viz., nausea, stasis, carbohydrate starvation, &c. If vomiting is once established the processes of nutrition become still more disturbed, and the patient may end in a state resembling that of diabetic coma. It is now easy to see why sugar in 3-drachm doses should be the most successful preventive treatment, as was found by Oriel to be the case. Much of it might remain behind in the stomach; but some of it would certainly get through into the intestine, raise the blood-sugar after absorption, and so break one link in the vicious chain.

On this theory it is possible to explain most of the well-known facts about sea-sickness.

Owing to the prevailing winds ships "pitch" from England to America and "roll" on the return journey. More people are sick going out, since the up-and-down movement of pitching is worse than the side-to-side movement of rolling. One of the best means of averting sea-sickness is to lie down flat. It is clear that this will not entirely do away with the effect of a bad pitch. Wearing a tight abdominal binder, or bracing the muscles of the abdominal walls to prevent sinking, are well-known prophylactics, and slow, deep respiration will act in the same way.

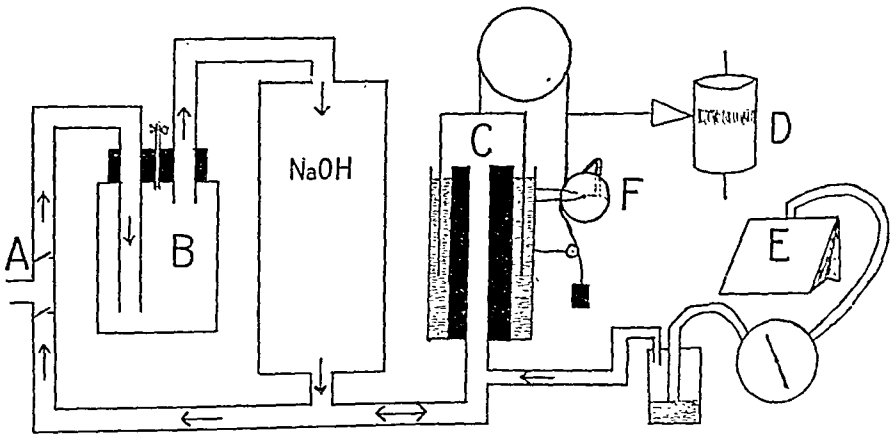
Other theories of sea-sickness have been dealt with by Oriel and need not detain us long. He found no evidence of any excessive stimulation of the labyrinth either by examining for nystagmus or by carrying out functional tests on the revolving stool in port and on board ship during the voyage. He himself met with three deaf mutes travelling together for the sake of company—one of them editor of the *Deaf Mutes' Gazette* of America. One of these three was sick, though it must be admitted they were in the tropics at that time when sickness on board ship was due to other causes. All these points are against the labyrinthine theory, although it may play a part in certain cases. Similarly, he has dismissed the neurotic or auto-suggestion theory. Undoubtedly people are sick as soon as they reach the ship or when travelling on perfectly calm water along the River St. Lawrence. Over-feeding, constipation, migraine, and pregnancy are all well-known predisposing causes; but sea-sickness is too definite an entity to be explained in any such way. Finally, we have the two theories of cerebral anæmia on the one hand, and cerebral congestion on the other. Although many of the facts I have enumerated fit in satisfactorily with either of these theories, there *is* evidence for a primary nausea, but *not* so far as I know for these other possibilities. In the present state of our knowledge it is hardly worth speculating on a possible fibrosis of the alimentary canal that may render old people immune to sea-sickness, or why babies are free; it is presumably owing to the jerking that people, and especially children, are occasionally sick on railway and motor-car journeys. It is quite clear that certain other factors may perhaps be present in these relatively uncommon cases; but this hardly affects our view of sea-sickness which may attack one-third of all the passengers on a voyage.

CARDIAC PAIN, ANGINA PECTORIS.

It may seem presumptuous in a short half hour even to attempt to say something new on the subject of angina pectoris; but as in these lectures I have

so far dealt, almost exclusively, with sensations in the throat, chest, and upper abdomen, it would seem strange to confine myself entirely to the upper alimentary tract as their cause, and spend no time at all on that intensely interesting subject, the cardio-vascular system, especially as within the next fortnight we shall be celebrating and meditating on Harvey's great discovery. Further, as a physician who has had the privilege, though a doubtful one, of experiencing these pains himself, and whose interest has been naturally aroused in this subject, I feel that I may have a special claim on your attention. Since these lectures are primarily experimental, I shall only mention theories of angina pectoris that have been brought forward up to the present time, so far as they have a bearing on the work described. One such theory has been advocated strongly by Verdon,[41] who claimed that angina pectoris is due to the disturbances of the nervous mechanism of certain spinal segments, arising not in the heart, but usually in the stomach or œsophagus. These organs become distended with gas, and the tension of the muscular coat stimulates nerve-endings which spread to the spinal cord and give rise to the anginal syndrome. Of course it is true that acute dilatation of the stomach may reflexly produce a serious and perhaps fatal cardiac disturbance, and symptoms may be relieved by the passage of a stomach-tube; but there are observations by Payne[22] and myself on two cases of ordinary angina which certainly negative this explanation as a universal cause of the condition.

FIG. 13.



E. T. K., a farmer, aged 42, had for some years complained of pain in the upper part of the chest on the left side after exertion. It used to pass down the left arm. He was a stout man of exemplary habits. There was no history of alcohol. X ray showed that the heart was greatly enlarged to the left side, and the stomach seemed somewhat displaced to the right. There was no valvular disease.

An œsophageal tracing was taken. The bag was 3 cm. above the dome of the right diaphragm. The diastolic pressure was 1 cm. falling to 0. The patient then took some exercise and slight pain followed. The mean pressure had fallen to −1 cm. and there were still no contractions. It was noticed that swallowing produced very little effect on two occasions; but on another occasion, after swallowing, a rise of 10 cm. pressure was observed.

Another patient who had mild anginal attacks after exercise used to be able to get rid of his pain by making a loud roaring noise—i.e., expelling his breath under pressure through a partly closed glottis. It was observed on the X ray screen that this manœuvre was followed by an increase in the volume of the gastric air bubble which is the reverse of what one would be led to expect on Verdon's hypothesis.

It was more or less by chance that Campbell and I[42] came to make observations that we think have a definite bearing on this subject.

The patient was a man who was being treated in the oxygen chamber of Guy's Hospital. His age was 66 and he was admitted for breathlessness and pain in the chest on Feb. 25th, 1924. He had always had good health till April, 1922, when he had to go into hospital for a time. He returned to his work as a carpenter, continuing under medical treatment, but had to give up work finally in July, 1923, for breathlessness and pains in the legs. He felt much better when he was discharged but was not able to go back to work. On readmission he complained of orthopnœa and short acute attacks of breathlessness at night; also of giddiness, insomnia, and loss of weight. He had attacks of pain which were brought on by exertion—the pain being substernal and præcordial and a little down both arms—especially if he walked after meals. He was diagnosed as myocardial disease. His heart was enlarged both to the right and to the left, the maximum transverse diameter being 7¼ inches. There were occasional extra-systoles but no bruits. There was a little œdema of his feet on admission, but none when he went into the oxygen chamber; there was no albuminuria. There were no abnormal physical signs in his chest and there was little sputum, although he had a cough. His breath could be held 15 seconds.

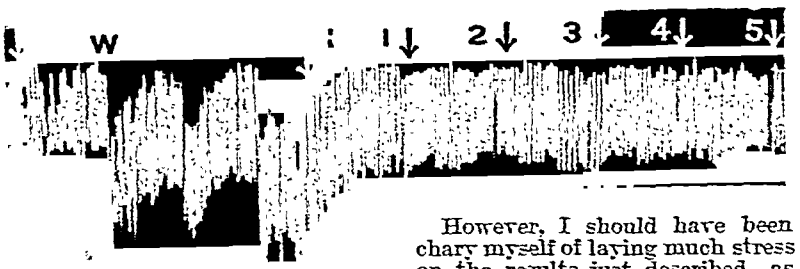
This patient was investigated by means of a closed circuit apparatus based on Douglas and Haldane's[13] apparatus; it is shown diagrammatically with certain modifications in Fig. 13. The patient breathes through inspiratory and expiratory valves A. During expiration the air passes upwards through a vessel B, from which a sample of air may be taken for analysis of the CO_2 percentage, then through a large tin containing soda lime and flake caustic soda in order to absorb the CO_2, and then into the spirometer (C), which rises, and the extent of the rise is indicated by the fall of the needle which is marked on the drum (D). During inspiration the air passes out of the spirometer through the inspiratory valve back into the lungs; at the same time an amount equal in volume to that which is absorbed by the lungs is drawn from the Douglas bag (E) through a meter and water valve into the closed circuit, so that the pressure remains constant. While the amount of the pulmonary ventilation can be measured from the drum record, it can also be determined by a work adder (F) as used by Prof. F. G. Benedict, by means of which the volumes of successive expirations are added together. The CO_2 output is calculated from the pulmonary ventilation and the CO_2 percentage is determined at frequent intervals. Actually the inspiratory and expiratory valves were attached to a face-piece which was fitted airtight to the patient, and held in place by straps attached to a canvas cap. The valves were attached to the apparatus by corrugated rubber tubing, so that the patient's respiratory exchange could be determined while he was sitting at rest, doing muscular work, and again sitting at rest until the values had again reached the resting level.† The muscular exercise consisted of stepping up and down a height of 13 inches by means of two steps, and this was repeated 18 times in three minutes.

Observations were made on a number of patients and normal students, and, as might be expected, level tracings were obtained on the drum; but in the case of the patient with myocardial disease a drop in the tracing commonly occurred during the exercise. For instance, in Fig. 14 (B), where the arrows mark intervals of a minute, the drop began after the

† It is hoped to describe in the Journal of Physiology a form of the above apparatus more suited for ordinary metabolic work.

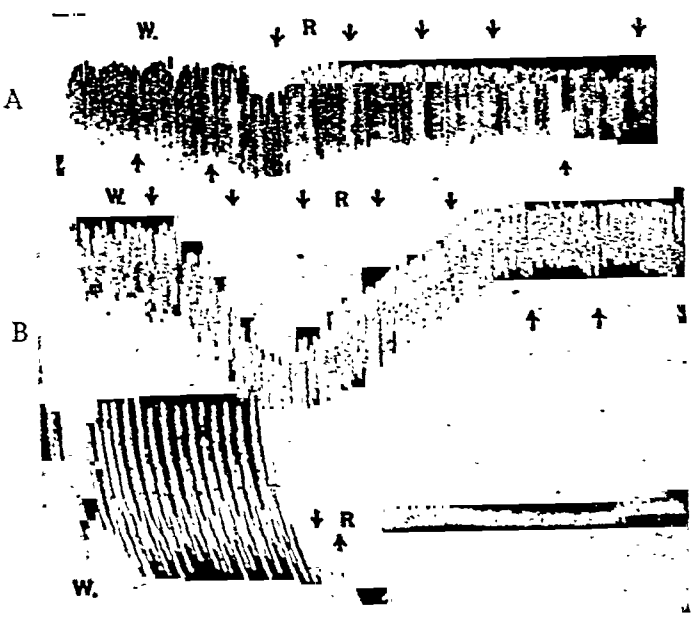
first 1½ minutes of work (W), and reached its maximal value after the third minute. The tracing gradually regained its normal level during the first two minutes of rest (R), after the exercise was finished. This meant that during the exercise the spirometer rose, and this could only have been due to an increase in the volume of air in the circuit. It was noticed at the same time that the pressure in the circuit rose slightly, and the intake of oxygen through the meter fell to zero. Since the CO_2 was being absorbed all the time the only place where the extra volume could have come from must have been from the patient himself. The volume in question amounted to about 1400 c.cm., but actually it must have been more than this, because the patient was absorbing oxygen all the time from the apparatus and yet no oxygen, or very little, was coming in through the water valve. If the normal amount of oxygen was absorbed by the lungs calculation shows that the O_2 absorbed from the circuit would be about 1200 c.cm.; but this figure is probably too high, so that actually during the work the patient expelled from his chest a volume intermediate between 1400 and 2600 c.cm. One possible explanation was that the patient's chest had fallen in, so that he had expired air from the lungs into the apparatus. This possibility was tested by recording by means of a stethograph the movements of the patient's chest on the drum below the respiratory tracing. Every time the patient stepped up there was a rise in the stethographic tracing; but the general level of the tracing remained constant, in spite of the fact that air was being expelled from the chest during the later part of the work. In fact, the only event that altered the stethographic tracing was when the patient sat down, as shown at R, which upset the adjustment of the apparatus. Clearly there was no falling in of the chest, and I think we may assume that if there was no falling in of the chest there was also no rise in the diaphragm, though we have no direct evidence on this point. Another possibility that suggested itself was that the air was expelled from the lungs because they were actually engorged with blood and perhaps at the same time there was some cardiac dilatation. If this is the case then we have found a method of measuring the efficiency of the pulmonary circulation which may obviously be of some importance in the future investigations of circulatory problems.

FIG. 15.



However, I should have been chary myself of laying much stress on the results just described, as they were only obtained in the case of a single patient, were it not for some very interesting evidence of Dr. G. P. Crowden's, which has been recently communicated to the Physiological Society. I will describe three of his results. A radiogram of his own chest was taken with the breath held at the end of a normal inspiration. A second radiogram was taken also at the end of a normal inspiration, but with the breath held and an extreme effort made to breathe out against obstruction. This is Valsalva's well-known experiment, and the result was that the pulse could not be detected at the wrist, though on the X ray screen it was observed that the heart was making slight movements. A third radiogram was taken at the end of a normal inspiration with the breath held, and an extreme effort made to breathe in against resistance (Müller's experiment). The effect of Valsalva's experiment was to cause a diminution in the size of the heart shadow, while the root shadows were much less dense than at the end of normal inspiration when no effort was made to expire. This can only have been due to much of the blood having been pumped out of the chest, while it was not able to enter from the venous reservoirs outside owing to the high intrathoracic pressure. In Müller's experiment, however, the shadow of the heart was much increased in size, being practically twice as large as in Valsalva's experiment, while the dark root shadows spreading out into the lungs indicated engorgement of the pulmonary vessels. If such a great alteration in the distribution in the blood is obtained in such simple experiments on a healthy subject our result is perhaps not so surprising after all.

FIG. 14.



Another point of interest is shown in tracing A of Fig. 14. In this case the patient had performed the same exercise; but it was on the third day of his treatment in the oxygen chamber. It is to be noticed that the drop was small, and probably did not amount to more than half a litre of air. A number of similar observations were carried out on this patient when he was under, and when he was not under, the influence of oxygen, and results agreeing with the foregoing were always obtained. Another observation was made that has a bearing on the present discussion. The patient told us that he felt præcordial pain during the exercise, and in one experiment this began just at the beginning of the second minute and coincided with a big drop in the tracing, which corresponded to about 1500 c.cm. No further systematic observations were made on this phenomenon of pain at the

time; but two years later he was again examined by Dr. Campbell, because it was thought that another way of proving that engorgement of the lungs was caused by exercise would be to determine the vital capacity which would be diminished under the circumstances. Before exercise the vital capacity was 3 litres, while immediately after the pain began the value was 2 litres. Immediately after the pain had disappeared the value was 3·1 litres. A similar diminution but not so large was noticed on a second occasion. In this connexion it is to be noted that Williamson [44] found by X rays that the heart was dilated immediately after exercise in four out of ten patients who on clinical grounds showed evidence of circulatory insufficiency, while normally the cardiac shadow diminished immediately after exercise.

The accumulation of blood in the lungs means that the right side of the heart has delivered the blood, but that the left side of the heart has failed to get rid of it. What is this but acute left-sided failure; may it not be accompanied by strain of the right ventricle in its attempt to keep the blood moving on? May not the pain be due to this strain?

In Fig. 14 and in another similar experiment the pulmonary engorgement began after about the first minute of exercise, and relief only began when the patient sat down after the exercise was finished. However, Starling showed that dilatation of the heart with lengthening of the muscle-fibres stimulates it to increased activity, and an experiment is shown in Fig. 15 in which during the exercise left-sided failure and recovery followed one another in quick succession, since there are three separate falls in the tracing representing volumes of 450, 300, and 450 c.cm., each followed by a return to the normal level.

The exact relation of the cardiac pain to the circulatory changes described requires much further observation. While the onset of pain has been observed to coincide with the fall in the tracing, it began on one occasion when the tracing had regained its normal level after recovery was complete. Cardiac pain might be expected to be analogous to other visceral pain, so that it would be caused by an increase in the muscular tension during diastole, which would depend on the same two factors of diastolic pressure and radius of curvature. Though cardiac pain might be most commonly felt during pulmonary engorgement and cardiac dilatation, it might also occur after recovery if the diastolic pressure became very high.

These experiments raise fresh problems for consideration. Is there such a thing as an acute right-sided failure lasting a few seconds associated with an accumulation of blood in the liver and large veins perhaps also accompanied by strain of the left ventricle with its characteristic pain? Certainly in my experience there are at least two distinct kinds of cardiac pain. There is a sharp, what the psychologists might call "bright," definitely localised pain on the right side of the chest very often at the inner end of the third right costal space. Then there is the ill-defined diffused constricting sensation which is felt at the top of the left side of the chest and simultaneously down the arm. Is the left-sided sensation due to left-side strain associated with acute right-sided failure and the right-sided sensation with a right-sided strain due to left-sided failure? I have used the word "acute" advisedly, since it is a well-known fact that typical angina does not occur in chronic gross heart failure, and as the heart failure improves the angina is increased. The patient that I have described illustrates this to a marked degree. He has recently been in hospital again owing to his anginal pain, while some weeks previously he was laid up with pain and swelling in the legs, but no pain in the chest. It may be that in gross cardiac failure with œdema the heart gives up the struggle, and does not work hard enough to produce its characteristic pain.

Let us consider the bearing of these facts on the treatment of angina. I can only say that in most cases of angina amyl nitrite acts like a charm; the pulse is quickened, the face is flushed, and the head swims, and at this point the pain rapidly fades away. It is well known that the blood pressure is not always raised in an attack, nor does it fall before the relief of pain by amyl nitrite. May the latter not act by stimulating the left side of the heart to renewed efforts? But if this is the case, is it really wise to attain the goal by whipping a flagging horse? It was in some such strain as this that I wrote on the pathology of angina in the last edition of the text-book for which I am responsible, and I was much interested to receive a letter from a doctor shortly after the appearance of the book in which he stated that he had attanded a lady for angina pectoris—it may have been coronary embolism—and that a full dose of amyl nitrite had failed to relieve her symptoms, and on administration of a second dose the patient died. If a moral may be drawn it is that a patient who has had angina should live within his cardiac reserve. He has many opportunities from the slight sensations he experiences of judging when he is overdoing things. It is better not to rely on drugs.

Some very interesting observations were brought forward at a recent meeting of the Physiological Society by Bramwell. He administered amyl nitrite to himself and then measured the effect on the electrocardiogram and on the sphygmogram from the carotid taken by a delicate optical method. The results are fascinating in the suggestions they raise, but tantalising because they contain no absolute proof of these suggestions. According to these experiments, amyl nitrite causes a diminution in the time occupied by the cardiac cycle; in other words, the heart is quickened. There is an increase in the rate at which the blood is expelled through the aortic valves. There is also an increase in the rate of the isometric contraction of the heart; but what is especially suggestive is that the maximum effect on the isometric contraction is reached before the maximum effect on the rate of ejection or on the length of the cycle. Is there not a suggestion here that amyl nitrite acts by stimulating the heart? Since writing the above Dr. Anrep has informed me that his experiments have proved that amyl nitrite definitely stimulates the cardiac muscle.

I think it possible to suggest a treatment for at any rate mild angina (angina minor) by considering Crowden's experiments, since it was a forced expiration against resistance that emptied the blood from the chest and diminished the size of the heart. One of the patients that I have already described obtained relief from his angina by making a roaring noise. I have myself successfully got rid of mild left-sided pain by this means. The immediate effect of the forced expiration is often instantaneous, and I think this method is often effective in preventing the return of the pain. I have one recent observation on right-sided pain where this procedure definitely made the pain worse, but the latter disappeared on taking a deep inspiration—i.e., the reverse of the left-sided pain.

So far I have treated the subject of cardiac pain as being due to an adequate stimulus, which is distensile. I should like to quote [45] what must be the earliest proof that other kinds of mechanical stimulation of the heart do not produce any effect on sensation. It was the case of a young nobleman who had had his ribs broken, and on the left side an abscess had formed and left a large gaping wound; he came to London when 18–19 years old. King Charles I. heard of it, and asked Harvey to see him and report on the case. Harvey found an extensive ulcer in the man's side—

"into which I could readily place three fingers and a thumb. Which done I straightway perceived a certain protuberant fleshy part, affected with an alternating extrusive and intrusive movement; this part I touched gently. Amazed with the novelty of such a state, I examined everything again and again, and when I had satisfied myself, I saw that it was a case of old and extensive ulcer, beyond the reach of art, but brought by a miracle to a kind of cure, the interior being invested with a membrane, and the edges protected with a tough skin. But the fleshy part (which I at first sight took for a mass of granulations, and others had always regarded as a portion of the lung), from its pulsating motions and the rhythm they observed with

the pulse—when the fingers of one of my hands were applied to it, those of the other to the artery at the wrist—as well as from their discordance with the respiratory movements, I saw was no portion of the lung that I was handling, but the apex of the heart covered over with a layer of fungous flesh by way of external defence, as commonly happens in old foul ulcers.

"Instead of a verbal answer, therefore, I carried the young man himself to the King, that His Majesty might with his own eyes behold this wonderful case; that, in a man alive and well, he might, without detriment to the individual, observe the movement of the heart, and, with his proper hand even touch the ventricles as they contracted. And His Most Excellent Majesty, as well as myself, acknowledged that the heart was without the sense of touch; for the youth never knew when we touched his heart, except by the sight or the sensation he had through the external integument."

I have quoted this case to illustrate the value of a clinical observation on the part of one who has been handed down to posterity, primarily, as an experimentalist. There is a movement nowadays that might be called "Back to clinical medicine," and which is apt to treat the experimental side of the subject with scant respect. I would urge that to place these two methods of observation in antithesis is a mistake. Certain it is that the application of the so-called experimental method to the alleviation of disease requires the most careful clinical observation, and it is not less certain now, than it was in Harvey's day, that clinical observation must be incomplete without further experimental study.

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SOME ASPECTS OF DENTAL SEPSIS,

FOCAL AND RESIDUAL.

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A careful search must be made for any focus of infection, such as a tooth, and, if one is found, it must be eradicated.

A SENTENCE such as this is almost certain to occur in any article or lecture on those diseases which we now regard as the results of bacterial toxæmia. When the teeth are incriminated the focus is believed to be completely eradicated by the extraction of those teeth. Yet it is evident from the results obtained that extractions are by no means a certain cure, and that many patients are no better and some are worse off than they were before. During the last 10 or 20 years so many teeth, innocent and guilty, have been sacrificed that it is coming to be fairly generally held among the lay population that a visit to the doctor is most likely to result in their being advised to part with some or all of their teeth. They see on all sides the dentures, conspicuous or otherwise, of their friends, and note that while some fortunate ones have been cured, many remain crippled. One meets with great divergence of opinion among the profession, and nowadays to mention dealing with the teeth as a cause of focal sepsis is to excite mildly derisive smiles amongst an audience of medical men. There is a general feeling that the thing may have been overdone, that there are factors which are not yet understood. There does seem some reason for believing that the procedure is becoming discredited not only among the lay population but also among the medical profession.

In this article the results of bacterial toxæmia are taken to include infective arthritis, sciatica, and neuritis generally, lumbago, and the so-called fibrositis. Where only one is mentioned the rest are implied and are only omitted to save space. Furthermore, the subject is dealt with entirely from the medical point of view, and purely dental aspects of the question are not considered.

The Teeth in Themselves not the Source of Trouble.

No one will deny that the teeth are very frequently the primary site of the infection, but it is obvious that if the infection is confined to the teeth and the teeth only, generalised symptoms are unlikely to result. A carious tooth is an infected tooth, and many teeth are the subjects of pulpitis, but neither of these conditions will in itself give rise to arthritis or fibrositis. In fact, it is not the infection of one or more teeth that matters. What does matter is the extension of the infective process into the neighbouring structures, first the periodontal membrane and—more important still—the alveolar bone. Both are highly vascular and there are plenty of blood-vessels to carry into the system the toxins which result from bacterial metabolism. Over and above this, the structure of the alveolar process, loose and with a multiplicity of cancellous spaces, is a particularly favourable medium for the growth and spread of organisms. When this invasion takes place the area of infected tissue is enormously and progressively increased, absorption of toxins occurs on the grand scale, and generalised symptoms appear.

How Infection Occurs.

There are three means of infection: (1) via the pulp and root canal; (2) by direct extension from the periodontal membrane; (3) by direct extension from a fragment of root left behind after extraction.

The first commonly results in the formation of an apical granuloma or abscess: that is to say, the process may be localised for variable periods of time. There may, however, be no localisation but an infection spreading into the alveolus without the

formation of any line of demarcation such as is necessarily implied by abscess formation.

The second is the commonest route. Considering the vast number of teeth which show signs of periodontitis, abscess formation is rare. The process is one of direct extension, first of all in the membrane and thence into the bone.

Every now and then during extraction a fragment of root is broken off and left behind. It is usually already infected, but in any case it becomes so before the socket has healed. After a lapse of time either an abscess forms or else a diffuse infective process starts and spreads in the alveolar bone.

Infection may also occur via the blood stream. It has been suggested that the organisms are carried by the blood stream from some other organ to the teeth, which they apparently select as their site of operation. This seems to be far less frequent than the other routes.

The Rôle of Pyorrhœa.

Many authorities hold that pyorrhœa is of little or no importance in the causation of arthritis and allied conditions, but the question seems to be entirely one of the extent to which the pyorrhœa has advanced. Strictly speaking, pyorrhœa is a symptom of an infection of the gingiva and superficial alveolus. So long as it is confined to superficial regions from which there is free drainage into the mouth, the effects on the system are likely to be those produced via the tonsils or the gastro-intestinal tract. Directly, however, the pyorrhœal pockets involve the periodontal membranes the way is open for direct extension of the infective process in the membrane and thence into the alveolar process.

Dental Skiagrams and their Import.

Apical abscesses, dental cysts, and granulomata are all striking features when seen in dental radiograms. Dead teeth can usually be recognised by changes in the pulp cavity and root canals, which become less defined and may be lost altogether. Periodontitis, when marked, is unmistakable. The healthy periodontal membrane appears in the negative as a fine, clearly defined black line between the tooth and the lamina dura. In periodontitis it is widened, sometimes along the entire surface of the tooth, but more often in parts, so that its outline becomes irregular and uneven. Proliferation of the lamina dura also occurs, so that the periodontal outline may vanish more or less completely, and the shadow of the tooth as a whole loses definition. More important, though less easy to recognise, are the changes which result from infection in the alveolar bone. In a radiogram the cancellous structure of the alveolar process can be clearly seen. The fine trabeculæ appear in the negative skiagram as light or white lines, crossing one another at angles and enclosing minute angular spaces which appear darker. When the bone is infected, these appearances change. The details become blurred; in places the trabeculæ are thickened and the small angular spaces are replaced here and there by rather larger, rounded spaces which appear almost black. These are minute areas of rarefaction, which are always to be seen in the neighbourhood of the apices of teeth which show periodontitis. They are, in fact, the earliest evidence of the invasion of the alveolar bone by an infective process. Larger oval or irregular-shaped areas of this rarefaction are often to be seen in the interdental septa or just deep to the alveolar margin where absorption is taking place; these denote infection of longer duration. Another common rarefactive change is an irregularly circular or oval area spreading from or around the apex of an infected tooth, an area which is more radioparent than healthy bone and appears greyish in colour or less dense than the surrounding tissue. In it the cancellous structure is less sharply defined and may be unrecognisable. This appearance is caused by a diffuse infection of the alveolar bone, spreading away from an infected apex or root without the formation of a classical abscess or any limiting process. Several such areas may be seen, most often in connexion with the premolar teeth. In time they coalesce, and eventually a large part of the alveolar process may be so affected. When the whole or a complete half alveolus is infected the condition is not so easily recognised in the films, but the loss of detailed structure and lack of contrast and density should reveal it. If such an area be explored it will be found spongy and soft, instead of hard and firm like healthy alveolar bone.

Changes in the nature of sclerosis may also be frequently seen. As mentioned above, the lamina dura in the neighbourhood of infected periodontal membrane commonly undergoes proliferation. There may be areas of sclerosis in the interdental septa or adjacent to the apices of the teeth. These areas may replace the whole of the normal alveolar process between two teeth. They appear as almost structureless whitish patches of irregular shape and variable size. By some they are regarded as attempts at repair or defence, but it seems equally reasonable to consider them as early reactive changes evoked by the invading micro-organisms.

The Contribution of Bacteriology.

Although there can be no doubt that a suitable vaccine is one of the most valuable means of treatment, it might be well to ask whether bacteriological investigations can help us in diagnosis. A streptococcus is almost universally held responsible for the lesions we are considering, but it is not possible to incriminate any particular type of streptococcus. It is reasonable to suppose that any streptococcus, given certain opportunities and a suitable environment, is capable of causing disease. The *Streptococcus hæmolyticus* and the *Streptococcus viridans* especially are the two which seem most active in producing arthritis or any infective condition. It is not possible to argue, however, that the finding of a streptococcus in a culture from a pocket or from the apex of an extracted tooth is to be regarded as evidence either that an infective process is at work or that the organism so isolated is causal. Swabs from any structure in the mouth will almost always yield a growth of streptococci of some sort, mixed with other organisms. There are, however, two ways in which bacteriological investigations can help towards forming an opinion. One is when the cultures made from a pocket give a pure growth of a streptococcus, and especially *S. viridans*, to the exclusion of other organisms. The second is when the patient's serum can be shown to contain agglutinins or other antibodies specific for the organism which has been isolated. Unfortunately, this can only be demonstrated in a small proportion of cases, but when it does occur it may reasonably be argued that infection is taking place and that the organism agglutinated is the offender. The converse argument—that the absence of demonstrable antibody formation denotes a deficient resistance on the part of the patient—cannot be regarded as equally convincing.

The Soil.

The difference in the way in which patients react is a striking feature of these infective conditions. In the imperfect state of our knowledge we explain this as being a question of resistance on the part of the patient. The great prevalence of arthritis, fibrositis, and the other results of focal sepsis seem to point to the conclusion that there is less resistance now among the general population than there was a generation ago. The title given by Pern to his article the Streptococcus—the Biggest Menace to Mankind,[1] has a very real application in these days when one considers the very large amount of incapacity and illness caused by this organism. Some patients show a surprisingly high resistance to a degree of infection which would speedily disable others. To give an example:—

A man, aged 62, with rosy cheeks and a healthy appearance, who had always led an active out-of-door life, complained of pain and stiffness in one shoulder and in his neck. This had been increasing since a fall a short while before. He was proud of the fact that he had an almost complete set of his own teeth. Radiograms showed that he

[1] Med. Jour. Australia, 1922, ii., 518.

had seven chronic apical abscesses which must have been developing for years. Yet his general condition was extremely good and he showed none of the symptoms—such as loss of colour, earthy complexion, depression, lassitude, and incapacity for physical exertion—which are usual in focal infections. His resistance was so great that it was not until bruising from his fall slightly damaged the shoulder-joint that the extensive infection in his mouth was able to give rise to any secondary effects.

As an instance at the other extreme, a woman of 42 came with a six months' history of acute sciatica which nothing relieved. She had had several attacks of "P.U.O.," labelled malaria as she had lived in East Africa. She looked sallow and ill. On radiographing her teeth, I found one large abscess at the apex of an upper molar tooth.

Resistance to the results of focal infection, therefore, is a very variable factor in different people, and one person may carry a focus of infection in his mouth to the end of his life without showing any apparent results from it, while a far lesser degree will speedily disable another. As the resistance varies, so does the recuperative power.

Methods of "Eradication" and Where They Fail.

When it has been decided that infection of the teeth is the cause of a patient's lack of health, the various procedures commonly adopted are :—

1. Complete clearance of all the teeth. This may be carried out forthwith without any previous radiographic or other scientific examination, on a "hit or miss" principle which has little to commend it.

2. Extraction of the obvious offenders, teeth with granulomata or apical abscesses.

3. Extraction of all teeth which show any skiagraphic sign of infection after careful consideration and previous examination.

4. Extraction of "dead" teeth only. The number of workers who confine their attentions to dead teeth and strongly oppose the extraction of any tooth which is still vital, whatever may be the radiographic appearances, is a large one, surprisingly large when one considers the inference to be drawn from such limited procedure. This inference is that only dead teeth can be so infected as to give rise to disease. One constantly meets with the expression of this view, not only in this country but also in reports on radiograms made in the United States, and when not expressed it is implied by the fact that only dead teeth have been dealt with. I feel that this opinion is in such strong opposition to the facts that I was greatly tempted to head this paragraph "The Dead Tooth Heresy." Nothing, in the present state of our knowledge, affords any grounds for the supposition that a tooth must be non-vital before it can be concerned in focal sepsis.

Any of these procedures may prove successful. Any of them may fail, and the reason for failure is the same in all the groups. It is because the original treatment is not radical enough and residual infection is left behind. Where a solitary apical abscess, for example, is dealt with by simple extraction, it is reasonable to expect that the resulting drainage, followed by granulation and healing of the bone, will put an end to the trouble, but when there is diffuse infection involving the apices of two or three teeth or one-half of the alveolar process, then it is not conceivable that the mere extraction of the teeth will in all cases put a stop to the infective process. Most of the softened infected bone is left behind, and in it enormous numbers of organisms continue to multiply and pour their poisons into the blood stream almost as freely as before the teeth were extracted. The gum heals with remarkable rapidity. Even an abscess cavity, left when the tooth has been extracted, is quickly covered over by dense gum tissue before it can be filled with healthy bone. Owing to this rapid healing, the length of time during which drainage can take place is very limited and, where a large area is involved, the amount of drainage must be almost negligible.

The Logical Treatment.

If we are agreed that a certain group of symptoms is due to an infective process, the logical treatment is obviously the removal of the source of that infection. If, in the condition under discussion, we cannot bring about this end by simple extractions, we must take such further steps as will ensure it as far as possible. This means that, in addition to extraction of teeth, any *unhealthy bone must be removed also, or, in other* words, a partial or complete alveolectomy must be performed. This sounds a formidable undertaking both for the patient and for the operator, but it is not in fact so severe as it sounds. Having submitted many patients to it and from personal experience as well, I *can say that the general effects in the way of shock*, &c., are slight, the amount of pain little if any more than after ordinary extractions, while healing and consolidation are rapid and dentures can be made to fit quite as perfectly as after simple extractions.

Briefly stated, the operation consists in removing the teeth, elevating a flap of gum tissue, excising the interdental septa, and removing all soft, spongy bone from round the tooth sockets. When hard and healthy bone is reached, the rough edges are smooth with a burr and the flaps of gum stitched together. Where only a small area of the alveolus is involved it may be possible to remove the unhealthy bone by way of the open socket or by removing quite a small portion of the buccal surface of the alveolus. In any case, the extent of the procedure is determined by the point at which healthy bone is encountered, but the important part of the proceeding is to leave behind no unhealthy bone.

Residual Infection.

We all have patients who have had their teeth extracted without experiencing any improvement of the condition for which the extractions were done. This disappointing result is most common in infective arthritis. It may be that in a certain number the condition of their teeth was not responsible for their trouble, but I believe that many such results are due to residual infection, and this belief is confirmed by radiograms taken of the edentulous jaws. Any or all of the bone changes resulting from infection may be found persisting in the alveolar processes after the extraction of teeth: tooth sockets which have never consolidated and are little more than chronic bone abscesses, areas of sclerosis, and—most frequent of all—areas of rarefaction, large and small, diffuse and limited. If we accept these radiographic appearances as evidence of infection, then we cannot be surprised that the patients do not improve. To cite a typical case :—

A man aged 44, who had had no illnesses, suddenly developed arthritis in one shoulder and one toe-joint. All his teeth were extracted, but the condition progressed and gradually affected other joints. A year later the tonsils were removed, but this caused no cessation in the progress of the disease. When seen two years after the beginning of the arthritis, practically all his joints were involved and he was a cripple. Radiograms of his edentulous jaws showed that the whole of his upper alveolar process was still infected, hardly any normal alveolar structure being visible, while the lower alveolus showed numerous areas where infection still persisted.

There is another type of residual infection which was first described by Eyre. Normally, the occlusal surface of the alveolar process appears in the radiograms as a sharply defined, smooth edge when consolidation is complete after the extraction of the teeth. One frequently sees small areas where the smooth edge is replaced by a number of minute, irregular, bony projections resembling the teeth of a fret-saw. These areas are due to persistent infection deep to the gum, and Eyre has demonstrated the invariable presence of the *Streptococcus viridans* in cultures made from these bony spicules. Such a state of affairs is clearly capable of maintaining a supply of bacterial toxins in the general circulation.

Alveolectomy versus Extractions.

This does not mean that we should advise alveolectomy, partial or complete, for every patient who is suffering from the effects of focal sepsis arising in connexion with the teeth. We know that in a large number of cases simple extraction of the infected teeth is sufficient to bring about a cessation of the trouble. Patients vary in their resistance and in their

recuperative power. In one patient the extraction of teeth and the short period of drainage which follows is sufficient to swing down the balance towards a recovery which may be permanent. In others a temporary improvement is followed by the gradual reappearance of their troubles. It is difficult to tell beforehand how any one particular patient will respond to extractions, and there are a certain number in whom it is difficult to decide whether alveolectomy is called for or whether simple extractions will prove sufficient. We may divide all patients into three classes. In the first come patients with one or perhaps two apical abscesses or a granuloma, in whom the process is limited, and whose general condition is good. For these it may reasonably be expected that simple extractions are all that is required. Class 3 consists of those who have an obvious diffuse infection of one or both alveolar processes and who show signs of a severe degree of toxæmia in addition to joint or fibrositic trouble. These call for alveolectomy. In this third class also come the patients whose alveolar processes show residual infection after their teeth have been extracted. Class 2 is the one which affords considerable difficulty. There may or may not be a granuloma, but two or three teeth show a considerable degree of periodontitis with early changes in the bone. Possibly the premolars show periodontitis, while the molars show loss of definition of their apices and of the surrounding alveolar bone. I believe that all such cases should have the position laid clearly before them and be advised to have alveolectomy performed, especially when there is any degree of toxæmia. These are the patients who are likely to improve with simple extractions, but after a time they will relapse and slowly become worse than before, because infected bone has been left behind.

Clinical Condition of Patient the Deciding Factor.

The interpretation of dental radiograms is a matter of considerable difficulty, and the difficulty lies, not in deciding which teeth are diseased, but in determining which are healthy. In practically every set of dental radiograms there are appearances which can be interpreted as evidence of disease. For instance, there are few people who do not show some degree of periodontitis, especially round their premolar teeth. Hence it is not possible to decide from the radiographic appearances alone what procedure must be undertaken to bring about the cure of any case. Just as it is the general clinical examination which in the first instance brings the teeth under suspicion, so the final decision can only be made on the results of this examination. The signs and symptoms must be evaluated and an attempt made to determine the degree of resistance and recuperative power, especially taking into consideration the amount of lassitude, tiredness, and mental depression. The blood must be examined to find out the degree of anæmia and the proportion of polymorphonuclear leucocytes to lymphocytes. Bacteriological and serological examinations should be made. These results are collated, and in the light of this knowledge the radiograms are examined in order that the final decision can be made as to the extent of the mischief and the procedure required to eradicate it. This decision must ensure, first, that no innocent teeth are sacrificed; and, secondly, that no infected tissue is left behind to continue the disease. Whatever course is decided upon, vaccine therapy will be required after the mouth has been dealt with. Finally, an immunising course of vaccine administration must always precede any operative measures, for there are a number of cases on record in which fatal septicæmia or septic pneumonia has followed the extraction of a number of infected teeth. It is, moreover, a matter of regrettably common experience to meet with patients in whom an infective process, involving only one or two joints, has flared up and affected many or all of the remaining joints because they had not previously been protected by an immunising course. In arthritis and the allied conditions we are dealing with some of the most prevalent and crippling diseases which afflict mankind, and our measures, both diagnostic and curative, must be commensurate.

ABDOMINAL PAIN IN PREGNANCY.

By C. S. LANE-ROBERTS, M.S. Lond., F.R.C.S. Eng.,

OBSTETRIC SURGEON TO OUT PATIENTS, ROYAL NORTHERN AND QUEEN CHARLOTTE'S HOSPITALS.

Many cases of abdominal pain in pregnancy, pain that is often severe and that occurs continuously or in crises, show no physical signs of any kind. Some people are undoubtedly sensitive to the stretching of the uterus and abdominal wall and to uterine contractions, but to the majority these gradual processes, with the incessant fœtal movements, do not cause more than discomfort. Many women call for support of the pregnant abdomen, others cannot put up with any pressure on the skin. Parous women, however, generally need some form of corset or belt. Constipation and flatulence are almost universal during pregnancy and frequently give rise to pain. The stretching of the round ligaments often causes pain between the twelfth and thirtieth weeks either in the groins or in one or both sides of the uterus. During the early weeks the pain may cause suspicion of an extra-uterine gestation, appendicitis, or other serious lesion, but there may be no physical signs to support the diagnosis. Later on the pain is often in one or other hypochondrium or above Poupart's ligament, and may be severe enough to keep the patient in bed. There are, however, no physical signs, no tenderness, no rigidity, and no constitutional signs or symptoms.

The commoner organic causes of abdominal pain in pregnancy are as a rule easily recognised, though sometimes the differential diagnosis may be difficult. They may be considered in three groups: where the pain (1) appears limited to the uterus, (2) originates in the adnexa, and (3) is due to associated conditions.

Some Conditions Confined to the Uterus.

(*a*) *Undue stretching of the uterus*, in cases of dual pregnancy sometimes, in acute hydramnios always, gives rise to pain, breathlessness, and palpitation. The sudden increase of amniotic fluid in acute hydramnios is simple to diagnose, as it is rare, develops suddenly, and may be associated with albuminuria and other toxæmic signs. The symptoms are due less to the quantity of fluid than to the suddenness of its collection. The patient, as she lies propped up in bed, often looks like a cardiac case, with cyanosed lips and face. There may be flatulent dyspepsia, vomiting, constipation, a rapid pulse, and œdema of the legs, vulva, and lower abdomen, which is as tense as a drum and very tender. A fine thrill may be obtained, no fœtal parts can be detected, but ballottement may usually be elicited by vaginal examination. Chronic or gradual hydramnios may be more difficult to diagnose from an ovarian cyst complicating pregnancy or an associated ascites. Some patients with ovarian tumours may give a history of amenorrhœa, while the breasts may be enlarged and secrete fluid, and the colour of the vagina may be bluer than usual from pressure. In such cases chief reliance should be placed on the general contour of the swelling, the fluid thrill, and the absence of fœtal parts. The ovarian cyst complicating pregnancy may give considerable trouble in diagnosis, but ascites should not, although it may coexist with hydramnios.

(*b*) *Fibromyomata* are more common in pregnant women than is usually thought, a fact which proves that they often cause no symptoms. Those that give trouble usually fall into one of three groups: (1) the subperitoneal pedunculated fibroids that may give rise to various mechanical changes, so causing pain; (2) the uterus distorted with fibroids, of which one is large and causes pressure symptoms; and (3) one fibroid only, which is either very big or else of moderate size undergoing degeneration. Pain with fibroids is generally due to pressure from incarceration

or to secondary changes. The symptoms and signs of the former condition are usually pelvic pain, sciatica, pains down the legs; interference with bladder function, either frequency or—less commonly—retention of urine; and pressure on the veins, causing varicose veins, hæmorrhoids, and œdema of the legs. The so-called "red" degeneration is the commonest type; small cysts form in the tumour and venous thrombosis occurs. Clinically the onset is sudden, characterised by intense pain and tenderness over the tumour. If the fibroid is large there are marked constitutional signs—high temperature, rapid pulse, prostration, and severe constipation. The diagnosis is established by sudden tenderness in a fibroid which had been previously known as a painless tumour. There is no added liability to abortion. Rest in bed usually brings about an alleviation of symptoms which seldom last for more than a few days. Operation is rarely called for and should be avoided if possible, as these fibroids are usually deep-seated and a myomectomy much increases the chances of abortion.

(c) Pain may be very prominent in *concealed accidental hæmorrhage*, which usually occurs in multigravida between the thirty-fourth and thirty-eighth week, and may become one of the most serious catastrophes of pregnancy. The mildest cases should be fully investigated at the onset of the first hæmorrhage. In a typically severe case the patient may feel off colour for a day or so; then, perhaps during some exertion, she suddenly feels severe abdominal pain. This may be described as "something giving way," a "bursting" sensation, or as if some "tight band" of constriction were being tied round the abdomen. It may be indescribably bad, with no alleviation at all, so that the patient rolls about in agony and may faint or vomit.

All degrees of concealed hæmorrhage occur; some accompany or follow a revealed hæmorrhage, and in others the external hæmorrhage appears later. All cases need immediate treatment and very careful nursing and watching.

(d) *A hydatidiform mole*, when it causes sudden stretching of the uterus, may cause great pain, which is apt to be most severe when hæmorrhage has occurred in some of the attachments of the mole to the uterine wall. These cases as a rule closely simulate a concealed hæmorrhage, for in both the uterus is of a hard, board-like consistency and markedly tender, and no fœtal parts can be felt or fœtal heart heard. Hydatidiform moles usually occur in the earlier months of pregnancy, when the differential diagnosis is not so difficult.

(e) *Rupture of the uterus* in pregnancy is rare, but about 4 per cent. of Cæsarean section scars rupture, so that old Cæsarean cases need watching when there is any unusual abdominal pain before or at term. The rupture may be partial or complete, and is usually ushered in by abdominal pain or vomiting. The pain may be very severe if there is intraperitoneal bleeding or spilling of liquor amnii. Shock is usually due to the onset of labour. The temperature becomes subnormal, the pulse rapid, running, and feeble, accompanied by cold sweating, vomiting, and pallor. On examination the abdomen is found to contain free fluid, and the fœtus may be free in the peritoneal cavity. Surgical attention should not be delayed. If the placenta is attached to the scar there may be very little pain, but a fatal hæmorrhage may occur in a very short time.

Spontaneous rupture of the uterus may occur in a pregnancy in one horn of a bicornate uterus, the accident being analogous to the rupture of the tube in a tubal gestation. Rare cases have been reported of the spontaneous rupture of the uterus during the later months for no apparent reason; they are said to be due to some weakness of the uterine musculature. These cases are associated with marked abdominal pain and shock due to the escape of liquor amnii and blood into the peritoneal cavity. Although rupture of the uterus in pregnancy is a very serious accident it is not attended by the same degree of shock and danger as is rupture of the uterus during labour. If, however, the rupture is of a cornual or an interstitial pregnancy the hæmorrhage may prove fatal in a few minutes.

Traumatic rupture of the uterus is always the result of direct violence, and there is much shock due to pain and hæmorrhage.

Pain Originating in the Adnexa.

The commonest cause of this is probably rupture of an extra-uterine pregnancy. The pain is usually very sudden; the patient may be able to say exactly what she was doing when it started, and it is so severe as to double her up. Often it is accompanied by faintness and sickness, due either to the severity of the pain or the degree of intraperitoneal bleeding or to both. The patient then rests, and either the pain is alleviated or the subsequent getting-up causes a return. The pain of rupture with an extensive intraperitoneal hæmorrhage may be very severe, with marked abdominal tenderness; these are usually the cases with a general effusion of blood. The pain of a tubal mole or slowly leaking erosion may be trifling, and no worse than a mild colic.

Salpingitis or salpingo-oöphoritis rarely lights up in pregnancy.

If ovarian tumours cause pain they usually do so either from pressure or from some axial rotation or degeneration. Rupture of the cyst may occur after incarceration, infection from the bowel with acute abdominal symptoms, or hæmorrhage. In most cases surgical treatment is called for, and is certainly indicated when there is abdominal pain and tenderness. The pain may be due to free blood in the peritoneal cavity, which may come from (a) rupture of a tubal or ovarian pregnancy; (b) an interstitial pregnancy or rupture of a cornual pregnancy in a bicornate uterus; (c) rupture of a uterine scar, from Cæsarean section or myomectomy; (d) rupture of a uterine vein. All these are severe cases, owing to the amount of blood lost, and in some the hæmorrhage may very quickly prove fatal. Ruptured tubal pregnancy is by far the commonest.

Rare though they are, the secondary abdominal and broad-ligament pregnancies must not be forgotten, as they may prove formidable problems at operation. Living full-term children have been removed from an amniotic sac that has grown either free in the abdomen or between the layers of the broad ligament.

Epigastric pain is an important prodromal symptom in pre-eclamptic toxæmia. Various explanations have been suggested to account for this pain, which may be very severe. The suggestion that in the worst cases it may be due to stretching of the peritoneum and capsule of the liver by the subcapsular hæmorrhage may be correct occasionally. Epigastric pain may come on shortly before an eclamptic fit, and may be the only prodromal symptom. Other upper abdominal pains occur in heart cases where compensation is failing and in tabetics, although severe abdominal crises are seldom seen outside infirmary practice.

Associated Conditions.

(1) *Pyelitis of pregnancy* is very frequent. Clinically the cases can usually be grouped under one of the following types.

(a) The renal type—where the signs and symptoms point to one or other kidney. There is severe pain in the back and loin, or on one side, more often the right. The patient feels and looks ill and has a furred tongue and often a shivering attack and rise of temperature. Headache is usually severe, but urinary symptoms are seldom complained of. The muscles over the painful area are rigid and the kidney is definitely tender. This is the type of case that will improve in a few days with rest in bed and the usual careful treatment, but is very liable to relapse with a recrudescence of all the symptoms. Sometimes the case is more severe with excruciating pain in the right iliac fossa and loin and marked tenderness and rigidity, ushered in by rigors and often accompanied by a temperature of 103° or 104° F. and a very rapid pulse-rate. Once treatment has been established the condition improves, but

recuperative power. In one patient the extraction of teeth and the short period of drainage which follows is sufficient to swing down the balance towards a recovery which may be permanent. In others a temporary improvement is followed by the gradual reappearance of their troubles. It is difficult to tell beforehand how any one particular patient will respond to extractions, and there are a certain number in whom it is difficult to decide whether alveolectomy is called for or whether simple extractions will prove sufficient. We may divide all patients into three classes. In the first come patients with one or perhaps two apical abscesses or a granuloma, in whom the process is limited, and whose general condition is good. For these it may reasonably be expected that simple extractions are all that is required. Class 3 consists of those who have an obvious diffuse infection of one or both alveolar processes and who show signs of a severe degree of toxæmia in addition to joint or fibrositic trouble. These call for alveolectomy. In this third class also come the patients whose alveolar processes show residual infection after their teeth have been extracted. Class 2 is the one which affords considerable difficulty. There may or may not be a granuloma, but two or three teeth show a considerable degree of periodontitis with early changes in the bone. Possibly the premolars show periodontitis, while the molars show loss of definition of their apices and of the surrounding alveolar bone. I believe that all such cases should have the position laid clearly before them and be advised to have alveolectomy performed, especially when there is any degree of toxæmia. These are the patients who are likely to improve with simple extractions, but after a time they will relapse and slowly become worse than before, because infected bone has been left behind.

Clinical Condition of Patient the Deciding Factor.

The interpretation of dental radiograms is a matter of considerable difficulty, and the difficulty lies, not in deciding which teeth are diseased, but in determining which are healthy. In practically every set of dental radiograms there are appearances which can be interpreted as evidence of disease. For instance, there are few people who do not show some degree of periodontitis, especially round their premolar teeth. Hence it is not possible to decide from the radiographic appearances alone what procedure must be undertaken to bring about the cure of any case. Just as it is the general clinical examination which in the first instance brings the teeth under suspicion, so the final decision can only be made on the results of this examination. The signs and symptoms must be evaluated and an attempt made to determine the degree of resistance and recuperative power, especially taking into consideration the amount of lassitude, tiredness, and mental depression. The blood must be examined to find out the degree of anæmia and the proportion of polymorphonuclear leucocytes to lymphocytes. Bacteriological and serological examinations should be made. These results are collated, and in the light of this knowledge the radiograms are examined in order that the final decision can be made as to the extent of the mischief and the procedure required to eradicate it. This decision must ensure, first, that no innocent teeth are sacrificed; and, secondly, that no infected tissue is left behind to continue the disease. Whatever course is decided upon, vaccine therapy will be required after the mouth has been dealt with. Finally, an immunising course of vaccine administration must always precede any operative measures, for there are a number of cases on record in which fatal septicæmia or septic pneumonia has followed the extraction of a number of infected teeth. It is, moreover, a matter of regrettably common experience to meet with patients in whom an infective process, involving only one or two joints, has flared up and affected many or all of the remaining joints because they had not previously been protected by an immunising course. In arthritis and the allied conditions we are dealing with some of the most prevalent and crippling diseases which afflict mankind, and our measures, both diagnostic and curative, must be commensurate.

ABDOMINAL PAIN IN PREGNANCY.

By C. S. LANE-ROBERTS, M.S. Lond., F.R.C.S. Eng.,

OBSTETRIC SURGEON TO OUT PATIENTS, ROYAL NORTHERN AND QUEEN CHARLOTTE'S HOSPITALS.

Many cases of abdominal pain in pregnancy, pain that is often severe and that occurs continuously or *in crises*, show no physical signs of any kind. Some people are undoubtedly sensitive to the stretching of the uterus and abdominal wall and to uterine contractions, but to the majority these gradual processes, with the incessant fœtal movements, do not cause more than discomfort. Many women call for support of the pregnant abdomen, others cannot put up with any pressure on the skin. Parous women, however, generally need some form of corset or belt. Constipation and flatulence are almost universal during pregnancy and frequently give rise to pain. The stretching of the round ligaments often causes pain between the twelfth and thirtieth weeks either in the groins or in one or both sides of the uterus. During the early weeks the pain may cause suspicion of an extra-uterine gestation, appendicitis, or other serious lesion, but there may be no physical signs to support the diagnosis. Later on the pain is often in one or other hypochondrium or above Poupart's ligament, and may be severe enough to keep the patient in bed. There are, however, no physical signs, no tenderness, no rigidity, and no constitutional signs or symptoms.

The commoner organic causes of abdominal pain in pregnancy are as a rule easily recognised, though sometimes the differential diagnosis may be difficult. They may be considered in three groups: where the pain (1) appears limited to the uterus, (2) originates in the adnexa, and (3) is due to associated conditions.

Some Conditions Confined to the Uterus.

(*a*) *Undue stretching of the uterus*, in cases of dual pregnancy sometimes, in acute hydramnios always, gives rise to pain, breathlessness, and palpitation. The sudden increase of amniotic fluid in acute hydramnios is simple to diagnose, as it is rare, develops suddenly, and may be associated with albuminuria and other toxæmic signs. The symptoms are due less to the quantity of fluid than to the suddenness of its collection. The patient, as she lies propped up in bed, often looks like a cardiac case, with cyanosed lips and face. There may be flatulent dyspepsia, vomiting, constipation, a rapid pulse, and œdema of the legs, vulva, and lower abdomen, which is as tense as a drum and very tender. A fine thrill may be obtained, no fœtal parts can be detected, but ballottement may usually be elicited by vaginal examination. Chronic or gradual hydramnios may be more difficult to diagnose from an ovarian cyst complicating pregnancy or an associated ascites. Some patients with ovarian tumours may give a history of amenorrhœa, while the breasts may be enlarged and secrete fluid, and the colour of the vagina may be bluer than usual from pressure. In such cases chief reliance should be placed on the general contour of the swelling, the fluid thrill, and the absence of fœtal parts. The ovarian cyst complicating pregnancy may give considerable trouble in diagnosis, but ascites should not, although it may coexist with hydramnios.

(*b*) *Fibromyomata* are more common in pregnant women than is usually thought, a fact which proves that they often cause no symptoms. Those that give trouble usually fall into one of three groups: (1) the subperitoneal pedunculated fibroids that may give rise to various mechanical changes, so causing pain; (2) the uterus distorted with fibroids, of which one is large and causes pressure symptoms; and (3) one fibroid only, which is either very big or else of moderate size undergoing degeneration. Pain with fibroids is generally due to pressure from incarceration

As aids to the non-touch technique the following instruments will be found useful. Most of them come under the category of "combined instruments." For suturing wounds the surgeon can have nothing better than a Lane's dissecting forceps in the left hand and scissors of the Patiala pattern in the right.

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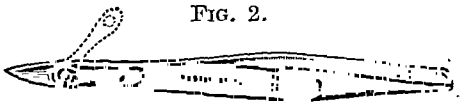

Forceps and knife combined.

With the tenaculum points of a Lane's forceps tissues can be picked up and adjusted to a nicety, and with its serrated surfaces well in contact ligatures or needles may be securely held. The original pattern of Patiala scissors is not quite suitable, but

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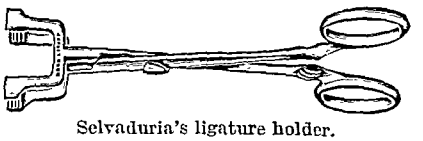

Selvaduria's ligature holder.

more in the manner of forceps than scissors, and with the convex surface towards the palm, so that the forceps ends project out. When thus held the same grip ensures its easy use either as scissors or forceps. With either of these two instruments an assistant can pick up a mop for swabbing, adjust wound edges, hold a running ligature taut, or cut a ligature. Of the two, the second is much the more serviceable and satisfactory.

For threading needles of the Reverdin type, such as the modification of Wu and Bonney, a useful instrument is the U-shaped forceps designed by my former house surgeon, Mr. David Selvaduria (Fig. 4).

Messrs. Down Bros., London, S.E., are the makers of all these instruments.

A CASE OF

HUMAN INFESTATION WITH LIVER FLUKE.

By S. W. Patterson, M.D. Melb., D.Sc., M.R.C.P. Lond.,
PHYSICIAN AND BACTERIOLOGIST, RUTHIN CASTLE, NORTH WALES.

In man the liver fluke (*Fasciola hepatica*) is a rare parasite, only 28 cases of infestation having been recorded in the literature up to 1915.[1] The early cases were discovered at autopsy; the first described being by Pallas in 1760 in a female in Berlin. The infection was mostly mild, and no symptoms or only trifling ones were present. In other cases a severe infection may lead to death; the symptoms, enlargement and painfulness of the liver, merely pointed to a disease of the liver. Of the 16 cases reported up to 1902 (Duffek [2]), jaundice occurred in three only.

In the present case the patient was a man, aged 43, who had been for nine months in West Africa in 1912, but had had no illness then or at other times except scarlet fever in 1910, influenza in 1918, and a pneumococcal septicæmia following infection at operation in 1924. The illness started at the beginning of November, 1927, with chills and mild rigors; the temperature, normal in the morning, would rise to 102°–103° at night followed by sweating. In addition to general malaise, there was an uncomfortable feeling in the upper abdomen, not related to food, and an irritating spasmodic cough which sometimes brought on vomiting. The patient went to a nursing home in Liverpool, where no abnormality was found except a leucocytosis of 18,000 per c.mm. with 11,000 (62 per cent.) eosinophil cells. The fever subsided, but discomfort in the abdomen continued, and at times severe attacks of colic occurred. There was no jaundice.

When seen at the beginning of January of this year ordinary physical examination revealed nothing abnormal; but the blood showed a leucocytosis of 14,700, of which 6200 (42 per cent.) were eosinophils. X ray examination was negative, except that the gall-bladder was not normally filled after the administration of iodeikon, and the faint shadow obtained appeared mottled. The watery stools after Epsom salts contained numerous ova of *F. hepatica*. The treatment adopted was non-surgical biliary drainage by drachm doses of 50 per cent. magnesium sulphate twice a week on an empty stomach, increasing doses of hexamine with bicarbonate of soda, and intravenous injections of stibosan, a preparation of tartar emetic.

The abdominal symptoms disappeared and the patient is well; the blood, however, shows still moderate eosinophilia, and ova are found in the stools when concentrating methods are used (see table).

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Aug. 8 ..	8,000	4	320	..

The following points are of interest in the case:—

1. *Diagnosis.*—As has been said, the diagnosis was made at autopsy in the early cases described. The ova can be found in the fæces, as in Ward's case [3]; but adult flukes would probably be digested during their passage through the alimentary canal. Clark [4] has found flukes in the pus at operation on empyema of the gall-bladder. Complement fixation has been described in liver fluke infections in sheep,[5] but as far as I know has not been applied in man. In the present case the symptoms pointed to cholecystitis with colic; the abnormal condition of the gall-bladder and the eosinophilia were explained by finding the characteristic ova, which are oval in shape, 140–160 μ long and 80 μ broad.

2. The high degree of *eosinophilia*. This is found in worm infections, especially during the invasion stage. In Ward's case [3] the eosinophils were 3700–6000 per c.mm., and up to 41 per cent. of the total leucocytes. Lawton [6] in Egypt found an eosinophilia in some cases of pyrexia of unknown origin (P.U.O.), which when traced afterwards were shown to be

much more slowly, so that the patient may be thoroughly debilitated for the rest of her pregnancy. She may have sudden exacerbations of symptoms without any apparent cause, and relapsing attacks in the puerperium.

(*b*) The abdominal type, where the abdominal pain is so severe that there may be difficulty in deciding whether the case is not one of appendicitis, cholecystitis, or intestinal obstruction. There is abdominal distension, rigidity, nausea, and perhaps vomiting with constipation. The temperature may rise to 103° or 104° and the pain may be excruciating. The patient may take a long time to improve and be very enfeebled for the rest of her pregnancy.

(*c*) The generalised type, where there is not much abdominal pain and the signs and symptoms are not localised to the abdomen. This group will not be considered here; the prognosis is bad for both mother and fœtus.

(2) *Acute Appendicitis.*—Pregnancy does not predispose to appendicitis, but the growing uterus may pull on and disturb adhesions formed after a previous attack, and may thus excite a renewal of the disease. It may be very difficult to diagnose, and in all suspect cases a careful examination of the urine and the blood should be made. The enlarged uterus, it should be noted, tends to raise the cæcum and appendix in the later months higher in the abdomen than normal. Almost 80 per cent. of the cases occur in the earlier months; they are rare in labour, and only occasionally come on in the puerperium. The mortality-rate is high, especially when there is suppuration; in one series of 500 cases over 30 per cent. proved fatal, and the incidence of fœtal death and abortion was 40 per cent. Pregnancy aggravates chronic appendicular infection, especially when the appendix is abnormal in length, mobility, shape, or position. Gangrene and perforation occur more rapidly during pregnancy. According to Lee there is more violent and widespread peritonitis, a weaker reaction, less likelihood of protective adhesions, increased vascularity, greater danger of thrombosis and embolism, less adequate drainage, more frequent abscess formation, and earlier intestinal obstruction. The mortality, which is higher after the seventh month, may be called the "mortality of delay." Where there is uncertainty a blood count should be done promptly; a leucocytosis of over 12,000 may be said to indicate surgical interference. Up to the fourth month the signs are as easily recognisable as in the non-pregnant. A rise of temperature, with vomiting, constipation, and localised and well-marked rigidity in the appendicular region, will usually point to the source of the trouble. The sudden onset, rapid pulse, and rise of temperature should distinguish the vomiting from that of pregnancy. The later cases, after perforation has occurred, always need operative treatment. Some cases of suppurative peritonitis may be difficult to distinguish from a concealed accidental hæmorrhage, but—although there is generalised abdominal pain and rigidity—there is in peritonitis a maximum of tenderness in the areas not occupied by the uterus, the flanks, and epigastrium.

(3) *Intestinal obstruction* may be difficult to diagnose in pregnancy. The "pernicious" vomiting of pregnancy begins early and steadily gets worse; its onset is rarely acute, it is not associated with pain, distension of the intestines, or interference with the passage of flatus, and it may be relieved by rectal feeding. Analysis of the urine should help the decision. Treatment is always surgical, if possible without disturbing the pregnancy. The intestinal obstruction may be due to the pregnancy, as in adhesions, a fibroid or ovarian neoplasm, or even the pressure of the pregnant uterus. Or it may be due to a separate and associated condition, such as a strangulated hernia, a volvulus, or a pelvic abscess.

(4) *Retroverted uterus*, with retention of urine, is important between the twelfth and sixteenth weeks of pregnancy. So many women in a normal pregnancy have backache and frequency of micturition at this stage that the condition of overflow incontinence resulting from incarceration of the retroverted pregnant uterus may be missed. There is great abdominal pain and acute distress. With the onset of cystitis the temperature and pulse rise and the patient is acutely ill. In spite of the characteristic physical signs a retroverted gravid uterus may easily be mistaken for other conditions of serious import—e.g., an intrapelvic ovarian cyst, some other tumour, a hæmatocele from a ruptured tubal pregnancy, or a retro-uterine fibroid with pregnancy.

(5) *Gall-bladder pain* occurs sometimes, more often in the later weeks of pregnancy, and calls for dietetic measures and medical treatment. Acute cholecystitis is rare, but the pain, which starts in the right epigastrium and hypochondrium, generally radiates to the right shoulder. Unless operated on at an early stage the gall-bladder is likely to rupture and cause a severe form of suppurative peritonitis.

(6) *Acute pneumonia* may show itself by acute abdominal pain and rigidity in the early stages, and may easily be missed.

(7) *Calculi*, renal, ureteric, and vesical, do occur in pregnancy, and may cause acute abdominal pain and need surgical treatment.

(8) *Suppurative pelvic peritonitis* may arise from many cases—e.g., appendicitis, acute cholecystitis, perforation of the pouch of Douglas by an instrument, and rupture of a pelvic abscess or a pyosalpinx.

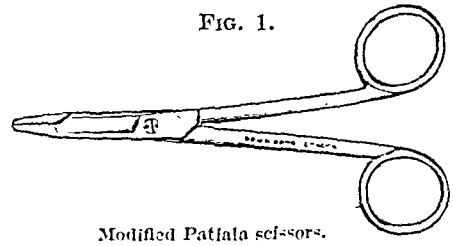
Clinical and Laboratory Notes.

A NOTE ON SOME INSTRUMENTS USEFUL IN THE NON-TOUCH TECHNIQUE OF SURGERY.

BY R. L. SPITTEL, F.R.C.S. ENG.,
SURGEON, GENERAL HOSPITAL, COLOMBO.

THE tendency of modern surgery is to discourage anything suggestive of unnecessary handling of tissues. The ideal set by bone and joint surgery, where even the gloved hand never once comes in contact with the wound, may be impracticable in certain other regions, such as the abdomen. This, however, is no reason why, once the necessary manipulations have been completed, the rest of the operation should not be conducted on the same high plane as the orthopædic operation. The omentum and peritoneum undoubtedly atone for many surgical delinquencies, and it is a significant truism that a

FIG. 1.



Modified Patiala scissors.

good abdominal surgeon is sometimes a poor orthopædist. Whenever possible, neither the gloved hand nor anything that comes in contact with it (such as swabs, ligatures, needles, or the working ends of instruments) should be permitted to touch the open wound. This is perhaps a counsel of perfection, but we need not fall far short of it—and that without sacrificing much time—if we cultivate the habit with the ideal in view. With a little practice it is quite easy to acquire the art of mopping, sewing, and ligating entirely with forceps. Incidentally, the economy in ligature material will be considerable, for no less than six knots may easily be tied with forceps with a length that will only allow one to be tied with the hand.

As aids to the non-touch technique the following instruments will be found useful. Most of them come under the category of "combined instruments." For suturing wounds the surgeon can have nothing better than a Lane's dissecting forceps in the left hand and scissors of the Patiala pattern in the right.

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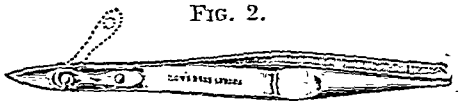

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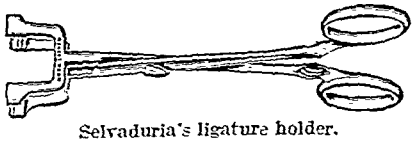

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infected with bilharzia. Dévé[7] and later Dew[8] found a marked eosinophilic reaction of the endothelial cells and leucocytes round the growing hydatid cyst in the livers of artificially infected pigs.

3. The *mode of infection* is usually by impure water or infected uncooked vegetables, such as watercress. In Duffek's case,[2] as in the present one, the infection began in October or the beginning of November, and the summer of 1901 like that of 1927 had been very wet and liver fluke had been a common disease of the sheep in the districts in which the cases occurred. As early as the fourteenth century the disease in sheep was described by Jehan de Brie[9] in his book on "the whole art of shepherding," "Traicté de l'estat, science et pratique de l'art de Bergerie, et de garder œilles et brebis à laine," published in 1379, and presented to the learned King Charles V. Chapter xxviii. of this book deals with "Dauve, a small herb (*Ranunculus lingua* and *R. flammula*) which by corruption when eaten engenders a sort of worm, which gets into and destroys the liver. Therefore the shepherd must keep his sheep away from marshes and low pastures in the month of March." It is now known that the infection is carried by water and uncooked vegetables, and that the pond snails (*Limnaeae*) act as intermediate hosts.

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A CASE OF RUPTURE OF THE ŒSOPHAGUS BY INDIRECT VIOLENCE.

By J. R. Murdoch, M.B. Edin.,
FIRST ASSISTANT MEDICAL OFFICER, NORTH MIDDLESEX HOSPITAL, N.

The following case of rupture of the œsophagus seems worthy of record:—

A boy, aged 6 years, was admitted to the North Middlesex Hospital after having been knocked down and run over by a motor-cycle. When seen on admission he was quite unconscious, with hæmorrhage from the nose and mouth. He died a few hours after admission.

Post-mortem examination revealed marked bruising of left chest wall and over left hip-joint, extensive bruising of scalp on left side, and a comminuted fracture of left humerus. The heart, larynx, and trachea were normal. Left pleural cavity was partially filled with dark reddish-brown fluid containing small particles of food. The base of the left lung was collapsed and very congested. No ribs were fractured, and the right pleural cavity and lung were normal.

A longitudinal tear was found on the left side of the œsophagus ¾ in. above diaphragm and 1¼ in. long. There was also a slight rupture of the diaphragm around the œsophageal opening. The œsophageal wall was extremely thin. The abdominal organs were all normal with no signs of injury. A large fracture of the skull was found running from the vault on the left side down into the left middle fossa, and there was an extensive extradural hæmorrhage on the left side.

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was opened by Dr. H. H. Scott, who illustrated his points by relating cases from his own experience. Typhoid, he said, was such a protean disease that the typical symptoms might be either in abeyance or so overshadowed by some symptom or syndrome that the true nature of the malady might escape the doctor. Sometimes these anomalies might be accounted for in the post-mortem room. The first anomalous group was that marked by unusual modes of onset or in which some prominent symptom led the observer off the scent. He gave three examples of this: (1) *Onset with a chill.* He had seen a white woman of 27, eight months pregnant, who had got up quite well in the morning and had a shivering fit at 10 A.M. which had lasted for an hour. At the end of it labour had begun and a healthy infant had been born. The mother had then gone on to typical typhoid fever. In another case—which would also serve as an example of pneumotyphoid—a native boy of 19 had been ill for several days before he saw the doctor, and by that time he had all the signs of lobar pneumonia. Consolidation had been found post mortem, but so also had typhoid ulcers. (2) *Signs of peritonitis.* A native of 20 had died with the signs of general peritonitis. At autopsy the peritonitis was found to be the result of perforation of a typhoid ulcer. The lad had apparently felt no serious discomfort before the perforation. (3) *Ambulatory Forms.* There was no doubt that the man who kept about in the early stages of typhoid was running a very grave risk; the mortality-rate was largely kept up by these cases. Dr. Scott illustrated this type from his own attack of typhoid. After ten days of severe headache and rising temperature he had examined the agglutination of his serum, but it had been negative, and was again negative five days later. On the seventeenth day of the illness, with a temperature of 103·6° F., he had had to travel several miles to give evidence in court, and had gone to bed on his return. So severe had the attack been that the temperature was not normal until the sixty-third day. The blood had given no reaction until the second relapse on the forty-eighth day.

The second group of anomalous cases was that in which special symptoms or unusual complications appeared. The first type was the *nervous* one. True meningitis might occur, more often serous than suppurative. He had seen a hemiplegic negro in whom the brain had been found normal post mortem, but typhoid ulceration had been present in the intestine. A Canadian man had developed local neuritis of both legs in his third attack of typhoid—a very severe one with two relapses, three severe hæmorrhages, and a temperature of 105°–106° for six days. He had had very tender toes and excruciating pain in the calves and feet. Two years later there was still abnormal fatigability and numbness. The second type was when *peculiar forms of fever* occurred. He had seen three afebrile cases, all exceptionally severe, and inverse and intermittent fever. Anomalous temperature charts might be the result of multiplication of the bacillus in the meninges, the kidney, or the biliary system. The third was masking of the basal condition by *coincident disease.* Typhoid might occur in a tuberculous patient or might localise early in the lungs, and tuberculosis might simulate typhoid. In malarial subjects the advent of typhoid might be preceded by paroxysms indistinguishable from ague, except that quinine did not check them. Any disease supervening on malaria was apt to assume an inter-

mittent or periodic character. Typhoid and malaria might simulate each other. The coincidence of the two was an interesting example of the antagonism of diseases—a principle now used therapeutically in the malarial treatment of general paralysis. He showed temperature charts illustrating the extreme mildness of typhoid fever in malarial patients; the trouble had been to keep them in bed. Yet they had occurred in a country where both typhoid and malaria were very severe, had a high mortality, and—occurring alone—caused prolonged illness and marked debility.

Dr. H. B. DAY reviewed the course of the typhoid infection from the pathological point of view. Mallory, 30 years ago, had shown that the reaction of the host was due to a proliferation of the reticulo-endothelial system, so that there was an aggregation of macrophages in the lymph nodes and vessels. The first clinical symptoms were due to the increase of toxic products in the circulation at a rate greater than could be neutralised or eliminated. The clinical symptoms at the end of the first week were due to the reactions of the body to bacilli in various parts. The reticulo-endothelial cells succumbed, necrosed, and became immeshed in fibrin.

Laboratory Tests.

The progressive leucopenia corresponded to the lack of attraction of the typhoid bacillus for polymorphonuclear leucocytes. Macrophages were not seen in an ordinary blood film, as they were ruptured. Urine tests were not sufficiently elective to be of much diagnostic value. Blood culture was usually positive in the first week, and might remain so up to the fourth week. It was the best means of positive diagnosis and there was no evidence that it failed in vaccinated persons. As only small numbers of bacilli got into the blood at any one time the results could not be uniformly successful; 80 per cent. was the highest success claimed. Stool and urine cultures were not conclusive, but could be tried later than blood culture. Carriers might cause a wrongful diagnosis, and on the other hand a genuine case might be missed, as the typhoid bacilli formed such a small proportion of the total flora of the stool. The Widal serum test was still the most convenient when a laboratory was not at hand, though it might be misleading in carriers and the recently vaccinated. Dudgeon had shown that fresh stimulation led to an increased yield of any antibody with which the body had previously been reacting—this was the principle of "protein shock," an unhappy term since the toxic antigen was certainly non-protein. The test might not be positive until late in the disease. The serum should be examined as early as possible, so as to be able to show a negative test turning positive. The agglutination reaction was the outward and visible sign of a chemical change. The typhoid antigen was readily absorbed by the blood elements and only freed by their disintegration. If the majority of it were soaked up by the macrophages the reaction might be negative.

Dr. P. MANSON-BAHR described his experience of work on typhoid in Gallipoli. It might not be possible to diagnose by the agglutination reaction a paratyphoid A infection until convalescence in a patient who had previously been inoculated against typhoid. During the war they had had to rely more and more on hæmoculture, although 80 per cent. of correct results was not often achieved. The urine test was very valuable in the second and third weeks, but he was less optimistic about fæcal culture. Often these well-tried servants of clinical medicine failed when they were most expected to succeed, and the man who specialised in fevers must also be a clinical pathologist and must never neglect the evidence of his eye, his stethoscope, and his finger. Marris's test had rather fallen into disfavour, but was most useful if conducted with proper precautions, as laid down by Marris. None of the typhoid-paratyphoid infections was dead in this country.

Clinical Features.

Dr. E. W. GOODALL said he was impressed by the uniformity of typhoid; wherever it was encountered it was the same disease. He could parallel from his own experience every one of Dr. Scott's cases. Pneumonia headed the list of mistaken typhoid diagnoses in every fever hospital; it might be accompanied by diarrhœa, abdominal pain, and enlargement of the spleen. He urged the importance of more coöperation between clinician and pathologist. He had tried typhoid serum, typhoid toxin, and injections of dead bacilli therapeutically, and in each case had had a few patients who reacted by a sharp rise of temperature and a rigor, and then had lost their fever and recovered. He thought, however, that these measures should only be tried in severe cases. There had been a remarkable decrease in the incidence of typhoid fever since he had started work at a fever hospital. Paratyphoid B infection was very mild compared with typhoid, and for the sake of the prognosis it was always worth while to differentiate them serologically.

Dr. A. CAWADIAS said he had seen many cases with sudden onset, accompanied by rigors, in Paris and Athens. In Paris this onset was due to defective immunity and indicated a grave prognosis; in Greece it was due to the malarial soil and patients did well. Simple typhoid vaccine produced very marked reactions in patients who had had malaria and also awakened their malaria: he had given quinine after typhoid inoculation as a routine in Greece. He did not think typhoid was more benign in the malarial patient. He mentioned a form he had seen—chiefly among children—associated with intense diarrhœa and very severe symptoms; post mortem there would be intense ulceration of the colon, resembling dysentery or paratyphoid. He thought this was due to secondary auto-infection by the putrefactive bacteria, giving an appearance of colo-typhoid. In Greece the agglutination test could not be relied on as so many people had had typhoid already. He had tried many treatments; vaccines never gave definite results, and the physician who used them always had before him the ghost of the negative reaction. He advised adherence to the classical methods.

Lieut.-Colonel W. B. ALCOCK said that the laboratory worker must join forces with the clinician. Paratyphoid B simulated pneumonia more often than typhoid. He had once recovered the typhoid bacillus from an abscess of the thigh and it was not uncommon in the muscles. Gallipoli cases had been very mixed infections—typhoid, Shiga, and *Amœba histolytica*. He had seen five infections in one man. He did not do agglutination tests to titre because of the zones of inhibition.

Dr. SCOTT, in reply, said that a colon infection was not necessarily dysenteric; it might be paratyphoid B, which could simulate dysentery very closely.

Dr. DAY, in reply, pointed out that a relapse might be due to excretion of bacilli with the bile. Vaccine treatment remained experimental and the whole subject of immunity needed transferring from the study of the blood to the study of the tissues.

ROYAL ACADEMY OF MEDICINE IN IRELAND

SECTION OF PATHOLOGY.

A MEETING of this Section was held on Nov. 30th when Dr. T. T. O'FARRELL, the President, exhibited a specimen of

Bothriocephalus Latus.

It was, he said, the third which he had encountered, the previous ones being recorded in 1916 [1] and 1918.[2]

The patient, a man aged 36, from whom the specimen was obtained, was born in County Leitrim, where he spent the first 11 years of his life. He subsequently lived in Belfast (10 years), Blackburn, England (3 years), and Belfast again (3 years). He frequently returned to his original home on vacation though he had never been abroad. Seven years ago he passed segments of a tape-worm (not identified). In September, 1928, he passed more segments, and was treated with filix mas, after which he passed the

[1] Trans. Roy. Acad. Med. Ireland, 1916, xxxiv., 272; see THE LANCET, 1916, i., 466.
[2] THE LANCET, 1918, i., 370.

infected with bilharzia. Dévé[7] and later Dew[8] found a marked eosinophilic reaction of the endothelial cells and leucocytes round the growing hydatid cyst in the livers of artificially infected pigs.

3. The *mode of infection* is usually by impure water or infected uncooked vegetables, such as watercress. In Duffek's case,[2] as in the present one, the infection began in October or the beginning of November, and the summer of 1901 like that of 1927 had been very wet and liver fluke had been a common disease of the sheep in the districts in which the cases occurred. As early as the fourteenth century the disease in sheep was described by Jehan de Brie[9] in his book on "the whole art of shepherding," "Traicté de l'estat, science et pratique de l'art de Bergerie, et de garder œilles et brebis à laine," published in 1379, and presented to the learned King Charles V. Chapter xxviii. of this book deals with "Dauve, a small herb (*Ranunculus lingua* and *R. flammula*) which by corruption when eaten engenders a sort of worm, which gets into and destroys the liver. Therefore the shepherd must keep his sheep away from marshes and low pastures in the month of March." It is now known that the infection is carried by water and uncooked vegetables, and that the pond snails (*Limnaeae*) act as intermediate hosts.

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1. Braun-Seifert: Thierisch, Parasit. d. Mensch., 1915, Berlin, p. 170.
2. Duffek: Wien. Klin. Woch., 1902, xv., 772.
3. Ward: Brit. Med. Jour., 1911, i., 931.
4. Clarke, R. C.: Personal communication.
5. Paccanaro: Bull. de l'Inst. Pasteur, 1909, vii., 481.
6. Lawton: Med. Jour. Australia, 1917, ii., 247.
7. Dévé: Compt. rend. de la Soc. de biol., 1905, ii., 49.
8. Dew: Med. Jour. Australia, 1925, i., 103.
9. Quoted by Huber: Zeit. f. Thiermed. u. vergl. Path., 1891, xvii., 77.

A CASE OF RUPTURE OF THE ŒSOPHAGUS BY INDIRECT VIOLENCE.

By J. R. Murdoch, M.B. Edin.,
FIRST ASSISTANT MEDICAL OFFICER, NORTH MIDDLESEX HOSPITAL, N.

The following case of rupture of the œsophagus seems worthy of record:—

A boy, aged 6 years, was admitted to the North Middlesex Hospital after having been knocked down and run over by a motor-cycle. When seen on admission he was quite unconscious, with hæmorrhage from the nose and mouth. He died a few hours after admission.

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DISEASES OF THE GUMS AND ORAL MUCOUS MEMBRANE.

Third edition. By Sir KENNETH GOADBY, K.B.E., L.R.C.P., M.R.C.S., L.D.S., Lecturer on Bacteriology of the Mouth, Dental Department, University College Hospital. London: Humphry Milford, Oxford University Press. 1928. Pp. 412. 42s.

THIS book affords a useful conspectus of dental disease for the doctor, and at the same time provides the dental reader with a good account of oral conditions. The chapter on general diseases originating from mouth affections has been revised and considerably improved. A few fresh illustrations have been added to other sections of the book. Here and there are minor alterations in the letterpress but otherwise the changes in this edition are slight. In the chapter on periodontal diseases there is no reference to the work of B. Gottlieb and H. K. Box which has considerably modified our views on the pathology of pyorrhœa. The brief account of lymphatic leukæmia might well have included a reference to the fact that there is a serious liability to intractable hæmorrhage from the mouth in this disease: a considerable literature has now accumulated to show that many of the cases of fatal bleeding after tooth extraction have really been due to lymphatic leukæmia and that the oral sepsis which made the extractions necessary is itself a manifestation of the leukæmic condition.

The book ranks as an important contribution to stomatology.

SPECIAL MEDICAL PATHOLOGY AND THERAPY.

Strümpell-Seyfarth Lehrbuch der Speziellen Pathologie und Therapie der inneren Krankheiten. Twenty-seventh edition. By CARLY SEYFARTH, M.D., D.Ph., Professor für innere Medizin der Universität, Leipzig. Leipzig: F. C. W. Vogel. 1928. Vol. I., pp. 872. Vol. II., pp. 989. M.25 each vol.

Prof. Seyfarth has revised for the third time since the death of Strümpell this excellent and comprehensive manual, which has been famous since 1883. We are not surprised to learn that it has been translated into English, French, Italian, Spanish, Greek, Turkish, and Japanese, with a pirate edition in Russian. In the twenty-seventh edition the sections on dysentery, septicæmia, tetanus, asthma, pulmonary tuberculosis, pyelitis, and pernicious anæmia have been rewritten. The total bulk of the book remains the same, partly because more sections have been put into small type. It is illustrated by 384 pictures and 16 plates: 93 of these are new, and have chiefly replaced old ones. Most of the illustrations are so well chosen that they command attention; for example, a coloured picture of the smooth atrophy of the tongue in long-standing pernicious anæmia conveys a wonderfully accurate impression of that condition. There are many other clinical photographs and radiograms of which the same may be said. The treatment of each subject is, wherever possible, primarily from the standpoint of its morbid anatomy. Some topics are well served by this method. For example, we are told in a brief paragraph that mesaortitis syphilitica is most marked at the beginning of the thoracic aorta and ends abruptly, is discovered by fine longitudinal creases in the intima with irregular flat bluish-white thickenings which may obstruct the coronary orifices, and that histologically the main change is inflammatory. The complications are then discussed, and there follows a description of clinical types, radiological appearances, diagnosis, and treatment. Other types of arterial disease are dealt with in the same thorough manner; but surely a compatriot of Pick should revise the statement that miliary aneurysms play an important part in cerebral hæmorrhage! The section on tetany has been brought up to date so that overventilation and parathyroid extracts are given a place. The clinical descriptions are excellent, and the accounts given of endemic tetany and "die Arthrogryposis" are so realistic that the English reader who has probably never seen them is well able to visualise them. Similarly, the cataract of post-operative tetany is graphically described. But it is hardly true that in tetany the serum calcium is always diminished. For ourselves we would be happy to find the pathology so simple. In the present state of our knowledge the classical German method of starting with morbid anatomy is not appropriate to this section of the book, and it should be rewritten on the basis of a chemical classification in which tetany with low serum calcium should be clearly differentiated from tetany with alkalosis. The sections on gigantism, eunuchoidism, pineal tumours, and the adrenal-genital syndrome are well written, and that on hypophyseal cachexia (Simmondssche Krankheit) is a welcome addition.

The paper, printing, and indexing are alike admirable. We heartily recommend this publication to all who are seriously interested in medicine, and we can only wish that in its forty-fifth year it may again be translated into English.

ULTRA-VIOLET RADIATION AND ACTINOTHERAPY.

Third edition. By ELEANOR H. RUSSELL, M.D., B.S., and W. KERR RUSSELL, M.D., B.S., Hon. Director, Sun-Ray Clinic, Newcastle-on-Tyne. Edinburgh: E. and S. Livingstone. 1928. Pp. 648. 21s.

IN its third edition this work has been much enlarged and has assumed a more ambitious character. It is no longer a concise introduction to actinotherapy, but a review of the physical and biological facts on which actinotherapy is based and of its clinical application. Since at present only a bare nucleus of facts have been generally accepted in this branch of therapeutics, it is perhaps premature to attempt to embody recent work, which still lacks confirmation, in a text-book, especially where limitation of space does not permit of critical discussion. The authors do not always make it clear whether their statements are based on their own experience or on the deductions of other workers; this is unfortunate, especially when they deal with controversial matter. In the clinical section they give illustrative cases from their own practice: if space had permitted survey of their cases as a whole, under the heading of each disease treated, it would have been a useful addition to this chapter. The book contains clear descriptions of lamps and apparatus, and many illustrations and useful diagrams. It will prove of value to anyone engaged in the study of actinotherapy.

THE DERMATERGOSES OR OCCUPATIONAL AFFECTIONS OF THE SKIN.

Third edition. By R. PROSSER WHITE, M.D., C.M. Edin., M.R.C.S. Eng. London: H. K. Lewis and Co., Ltd. 1928. Pp. 734. 35s.

EVERY chief of a dermatological clinic is aware that a growing percentage of his material is the result of irritation from dust and liquids: he is, indeed, often requested either by the patient or his medical attendant to give testimony to this effect. Some conception of the enormous scope of occupational affections of the skin to-day may be gathered from the index to this treatise, which occupies more than 200 of its 700 pages. The bibliography quoted is immense, and there are references to current literature on nearly every page of the letterpress. Such a method of handling the subject provides the reader with a most valuable encyclopædia, and one which will doubtless continue to be in constant demand by insurance companies and in the law-courts. This exhaustive method has its corresponding disadvantages. Such a well-documented treatise does not make a readable book. Moreover, over-emphasis, many italics, and the too frequent use of a thick type defeat their object of stimulating attention. As far as can be ascertained from a short survey of the contents there is no known external cause of cutaneous or mucocutaneous irritation which has escaped discussion or

present specimen which appeared to be the entire worm, though the head was not recovered.

The patient never exhibited any noticeable anæmia. A blood examination in November gave the following figures: red cells, 4,440,000; hæmoglobin, 96 per cent., colour-index, 1·0; white cells, 9280. Stained films showed slight anisocytosis with an occasional microcyte but no poikilocytosis. No nucleated red cells were found. The differential leucocyte count per cent. was as follows: small lymphocytes, 20; large lymphocytes, 14; hyalines, 10; polynuclears, 52; eosinophils, 2; basophiles, 2.

As in the other cases from the County Leitrim area, said the President, there was practically no anæmia and no eosinophilia. The patient had eaten freely of fresh-water fish, including pike, and also had an unusual predilection for raw meat.

Dr. J. T. WIGHAM said he thought the patient must have eaten raw fish, as he did not think that cooked fish caused the worm to appear. He thought that the host must be some animal other than man, or else the worm would have died out.

Dr. J. SPEARES asked if the head of the worm had been found, and, if so, whether there had been difficulty in finding it.

The PRESIDENT, in replying, said that the patient stated he never ate anything but thoroughly cooked fish, but it was evident that this was not the case. He thought it possible that this worm was fairly common and should be treated as an ordinary tapeworm. The head of the worm had not been found, and he personally was not satisfied that the worm had gone.

Dr. SPEARES read notes on a Case of Cancer in the Lung, and Mr. F. J. HENRY reported a case of Lymphosarcoma, specimens in each case being demonstrated by Dr. Wigham. Dr. A. B. CLERY showed an Adenoma of the Breast, and Dr. R. A. O. O'MEARA read a paper on Boveri's Reaction on the Cerebro-spinal Fluid.

Reports and Analytical Records.

STANIFORM.

(WHIFFEN AND SONS, LTD., CARNWATH-ROAD, FULHAM, LONDON, S.W.)

STANIFORM is a proprietary name for methyl stannic iodide. This new therapeutic agent is supplied (*a*) as an ointment consisting of vaselin with which is incorporated 2 per cent. of methyl stannic iodide, and (*b*) as a dusting powder composed of talc mixed with 5 per cent. of the iodide. On analysis figures rather lower than these were obtained owing to technical difficulties incidental to the analysis of so volatile a material. Methyl stannic iodide is a bright yellow crystalline powder practically devoid of odour, and possesses the advantages of not staining fabric. It has the formula $SnCH_3I_3$, and the specimen sent to us was of 95 per cent. purity, the balance probably being moisture. It is interesting to note that the molecule consists of 23 per cent. of tin and 74 per cent. of iodine.

Staniform is antiphlogistic, analgesic, and antiseptic in its properties. The use of tin is well known in staphylococcic infections and here it is combined with the potent germicidal properties of iodine. Staniform is of considerable benefit in local inflammations, and is claimed to induce an immediate soothing effect with rapid healing.

ABERDEEN MEDICO-CHIRURGICAL SOCIETY.—The annual business meeting of this society was held on Nov. 22nd, with Dr. Thomas Fraser, the retiring President, in the chair. The following office-bearers were elected:—President: Prof. Alexander Low: Vice-President, Dr. Charles Forbes: secretary, Dr. Harold Edgar Smith: treasurer, Dr. Robert Richards: editor of transactions, Mr. George Herbert Colt. The following were elected members of council: Dr. John Farquhar Christie, Dr. George Rose, Dr. William Brown, Dr. William Clark Souter, Dr. Frederick K. Smith, Dr. George Swapp, Dr. John Smith, and Dr. Thomas Fraser. Prof. Low was invested and installed in office.

Reviews and Notices of Books.

DISEASES OF THE INTESTINE

Including the Liver, Gall-bladder, Pancreas, and Lower Alimentary Tract. Third edition. By ANTHONY BASSLER, M.D., F.A.C.P., Consulting Gastro-enterologist, St. Vincent's Hospital, New York City. Philadelphia: F. A. Davis Company. 1928. Pp. 905.

THERE are two methods of producing fresh editions of books on a rapidly developing subject. Either the whole work is cast into the melting pot, with the result that practically a new book is produced, or, additions are made here and there, and extra chapters written, to bring the contents up to date. Prof. Bassler has adopted the second method in the third edition of this work which has the disadvantages associated with the sewing of new patches on old garments. But his main idea of studying digestion below the pylorus as a whole is such a good one that these are soon forgotten. The first 200 pages cover a brief study of the anatomy, physiology, and chemistry of the alimentary canal, from pylorus to anus, with a short description of clinical examination, history-taking, radiography, and the investigation of duodenal contents, stools, &c.; the technique of the tests mentioned being briefly described. A fine discrimination is exercised in estimating the value attaching to clinical examination on the one hand and ingeniously devised tests on the other. Thus while a warm tribute is paid to Vincent Lyons for his work on non-surgical biliary drainage, the author advises physicians not to depend on this or any other method of diagnosis alone, and not to lay too great stress on its significance when estimating the pathology of the gall-bladder in any individual patient. The book embodies the clinical experience of a highly trained and careful observer and herein lies its chief appeal. The opinions and theories of others are clearly set out, but again and again the author falls back on what he himself has seen, felt, or noted. Having supplied the data, Prof. Bassler argues the case with the reader in a logical way, and even where he does not carry conviction, he provokes thought. Nearly a hundred pages are devoted to "chronic excessive intestinal toxæmia," and include a long and detailed description of the fæces found in this condition; the reason for this becomes clear in the discussion on treatment, for Prof. Bassler believes strongly in autogenous vaccines. Much doubt has been thrown lately on the reliability of fæcal cultures; if they are to be of value, they require a technique beyond the powers of any but specially trained workers. It may be noted in passing that, with the exception of some of Prof. Bassler's own articles, the references at the end of each chapter all date from before 1920. It is especially to be regretted that so little mention is made of recent work on this side of the Atlantic. To quote but a few instances, the omission of D. P. D. Wilkie's work in connexion with the gall-bladder and duodenal ileus, of that of E. I. Spriggs and O. A. Marxer on diverticulitis, and of van den Bergh and J. W. McNee on jaundice will puzzle British readers. The sections on radiology are on the whole particularly good, but we noticed no mention of the need of rotating the patient to get all parts of the bowel in profile. The radiograms reproduced are carefully selected and well produced, but are arranged without much method. Thus there is no uniformity in the position of the patient relative to the reader whose right side may or may not coincide with the patient's right side. These are small blemishes and the discriminating reader will find the work a useful addition to his library. It is characterised by common sense and an observance of established principles, and, while the author advocates the views he holds himself, he is not intolerant of those advanced by others.

THE LANCET.

SATURDAY, DECEMBER 22, 1928.

THE KING'S ILLNESS.

More than four weeks of illness the KING's still demands and obtains the first place ights. Bringing a sense of deep strain into of his subjects and fellow-countrymen, ted them by their desire for his speedy So immediate and definite a change, from of the case, was more than could be but the following authoritative statement to the medical profession shows that this angerous illness has reached a stage where reasonable probability of improvement. Wednesday, Dec. 19th, at 8 P.M.

are signs that the KING's illness is pro- the public mind a sensitiveness, only too used by weeks of anxiety, and producing alarm and therefore distress, both of which lesirable to avoid. Doctors in their various n do much by their knowledge to main- and confidence. The present condition of STY can be best understood by recalling ges of this severe illness. In the first idual in its onset, there were to be eral infection with imperfect localisation; no cough and only one small patch of friction; blood culture positive (strep- and an irritative state of the nervous hich produced profound distress and llness. Yet with these was a wish, born ourage and the habit of duty, to make e illness and hold on to work, thus adding r and tear of the fever. Towards the end t phase came an accentuation of pleuritic hich extended to the diaphragm. The se was one of increasing toxæmia, with earance, dry cracked tongue, periods of exhaustion—in short, a clinical picture that of a case of severe typhoid fever d and fourth week, but with the added attacks of dyspnœa and cyanosis, due to the heart. With the next phase came an of fever and some evidence of localisation. culture was now negative, toxæmia was am was subsiding. The localisation in the did not result at this stage in effusion as puncture and excellent radiographs. A ater, however, the temperature rose rather a higher level, and on Dec. 12th there ce at the extreme right base of an effusion commenced between the lung and the . Drainage by means of rib resection was on the same day under general anæsthesia en, ether). The predominant organism in na has now been established to be identical treptococcus found in the blood. Though e process has become gradually localised, , coupled with the lowered vitality result- the length of the illness, must make the f healing difficult and tedious. Local however, is less pronounced to-day and tion apparent. To stimulate vitality of ief general exposure to ultra-violet rays from a mercury lamp has been made each day since Dec. 15th. The effect of these exposures is being checked by leucocyte counts and estimation of the bactericidal power of the patient's blood. There is reason to think that this employment of the ultra-violet rays has in combination with the treatment mentioned in previous statements been beneficial.

"It is hoped that the foregoing account will help towards an understanding of the future course of the illness. It will be apparent to medical men that not only the severity and length of the infection but the exhaustion resulting therefrom must make progress slow and difficult. At the same time dangerous phases of the illness have been surmounted and there are increasingly solid grounds for hoping that recovery will result from this long and anxious struggle."

The following medical men in addition to those previously mentioned have contributed to the KING's care during the past weeks: Sir Hugh Rigby, Dr. Francis Edward Shipway, Dr. Robert Stanton Woods, and Dr. Frank Dutch Howitt. The nurses are as before: Nurse E. Gordon (St. Thomas's Hospital), Nurse Catherine Black (London Hospital), Nurse Rosina Davies (London Hospital), and Nurse N. M. Purdie (Westminster Hospital).

DENTAL HEALTH EDUCATION.

THERE is something of a self-denying ordinance about the educational campaign carried out by the Dental Board of the United Kingdom, for the fruits of these efforts in the future should be such an improvement in the teeth of the nation that the originators will be deprived of their occupation. It is five years since the Dental Board decided to embark upon a campaign to educate the public in the importance of dental health. A committee investigated the question from November, 1923, until the following November, and early in 1925 a large and representative conference was convened at which a full and valuable discussion ensued. The details of propaganda were worked out by subcommittees, and the experience thus gained should prove useful to other public bodies who contemplate similar campaigns. The scheme may be studied in a report[1] by the Board's secretary for education, entitled Progress in Dental Health Education, 1924–28.

Films prepared for the Board, though mainly intended for juvenile audiences, are extremely well received by adults, and the returns show that copies of the films had been booked out about 120 times a year. It is found that the expense entailed prevents their being placed on regular cinema circuits for public exhibition, and their main use is for the children. Here, the Board maintains, is the most important field for educational work, and first a leaflet and, later, a book entitled Hygiene of the Mouth and Teeth have been circulated to the teaching profession throughout the country. The educational value of such leaflets is regarded as uncertain: nevertheless in connexion with the National Health Week in 1927 some 100,000 leaflets were distributed, and in 1928 more than double that number. The Board has made lectures one of the main features of its campaign. The method adopted has been to coöperate with various organisations, such as the British Red Cross Society and the Industrial Health Education Society in securing the audiences which it might otherwise be difficult to reach.

[1] Issued from the office of the Dental Board, 44, Hallam street, London, W.

at least mention; those who want more details can find them easily by referring to one or more of the original papers quoted in the footnotes. The twelve chapters deal successively with the action of physical agents (such as water, light, and X rays), acids, alkalies, metallic salts, the hydrocarbon series, mineral and vegetable dusts, special trades, synthetic dyes, plant irritants, and dermatitis due to animal and mould infections. Finally there is a useful section on war dermatoses. The meticulous industry of the author and his assistant, Miss Anne Newbold, is admirably illustrated by the article on the irritant gases which is not included under war dermatoses. This article alone would make the book a valuable and almost indispensable addition to every dermatological library. The illustrations, most of them reproduced from actual photographs, are technically perfect, but the lawyer and even the practitioner should be wary of basing an opinion on the clinical evidence afforded from these, for a "dermatitis artefacta" may show even less concrete and standard manifestations than the classical lesions in the field of dermatopathology. The author concludes with a full glossary of (mostly) dermatological terms, for which even the more expert reader will be grateful, since terminology has always been a stumbling-block in the study of skin diseases.

The book has passed through three editions since it first appeared in 1915; there have been two American impressions and a Russian translation. Dr. Prosser White deserves this success, for there are few more complete compilations in any special subject in the domain of British medicine.

THE DIAGNOSIS OF CHILDREN'S DISEASES.

Second (English) edition. By Prof. E. FEER, Zurich. Translated by C. A. SCHERER, M.D., F.A.C.P. London: J. B. Lippincott Company. 1928. Pp. 551. 35s.

THE success which we predicted for Dr. Scherer's translation of this well-known continental work is evidenced by the exhaustion of the first edition and the appearance of the second within three years. The work is concerned with clinical diagnosis, not with pathology or treatment, and consequently has required few significant alterations in the new edition. The size and form of the book have undergone little change, but numerous minor additions have been made to the text. A notable feature of the book is the excellence of the photographs, of which there are over 250. As a companion volume to a systematic text-book this work should continue to be of great value to students and practitioners.

A TEXT-BOOK OF FRACTURES AND DISLOCATIONS.

Second edition. By KELLOGG SPEED, S.B., M.D., F.A.C.S., Associate Professor of Clinical Surgery, University of Chicago. London: Henry Kimpton. 1928. Pp. 952. 50s.

THE aim of the writer of this text-book, as outlined in his preface, has been to present an account of practica and accepted methods of fracture treatment, avoiding fads. The principles outlined bear for the most part the stamp of common sense; the apparatus advocated is simple and practical. Where operation is advised, there is a commendable insistence upon the need for the most rigorous asepsis in dealing with bones and joints, a need not always sufficiently stressed by writers on fractures.

While the principles underlying Prof. Kellogg Speed's teaching are thus admirable, their presentation is less satisfactory. The book reads like a series of shorthand notes taken from lectures and printed without abridgement or revision rather than like the second edition of a serious work. In no section, except possibly that upon injuries of the wrist, to which those already acquainted with the author's writings will immediately turn, is there any orderly sequence. The first three chapters, which deal with general principles, leave the reader entirely confused. The essential matter which they contain could be expressed in half a dozen pages; the remainder is detail out of place. But throughout the book the same confusion is evident. The sections on head injuries, fractures of the clavicle, and fractures of the neck of the femur are particularly bad. The essential teaching is there, but it is so overlaid by repetition and confused by lack of clear arrangement that only the expert can find his way through the maze. A fictitious appearance of clarity is given by the large number of headings, which may have little reference to the matter which follows. The use of slang may be permissible, but its appearance in a text-book is an æsthetic error.

The illustrations on the whole are good. One cannot but regret that the author's very considerable experience is not presented in a more attractive form.

A COLLEGE TEXT-BOOK OF HYGIENE.

By Dean FRANKLIN SMILEY, A.B., M.D., Medical Adviser and Assistant Professor of Hygiene in Cornell University; and ADRIAN GOULD, Ph.B., M.D., Assistant Medical Adviser and Assistant Professor of Hygiene in the University. New York: The MacMillan Company. 1928. Pp. 333. 8s. 6d.

This book, written by members of the staff of one of the leading universities of the United States, contains material derived almost exclusively from American sources, including questionaires issued to Cornell undergraduates. During the past seven years the authors have lectured on personal and community hygiene to the students of the Cornell University in order to induce them to take steps to preserve their own health and to disseminate a knowledge of hygiene. No claim is made that the ground is covered exhaustively or even that it is mapped out in the best possible way. Admittedly, this kind of teaching must be dogmatic, but in their endeavour to be up to date, the authors have included many statements which have not yet gained the support of the best informed members of the profession. The book is consequently unsuitable as a text-book, although most of the information given therein is sound; it deals with live problems, and will prove useful and stimulating if read with caution by the already well-informed. The illustrations have been well selected.

JOURNALS.

JOURNAL OF INDUSTRIAL HYGIENE. November, 1928.—An interesting experiment is recorded by N. H. Mummery, who inoculated 79 employed persons with anticatarrh vaccine in the autumn. Out of this group 51 per cent. developed acute coryza compared with only 25 per cent. out of a control group of 72 persons. The inoculations are thought to have been given too late in the season and so the phase of increased susceptibility synchronised with increased opportunities for infection.—Certain data are given and discussed by R. M. Hutton relating to the occurrence of respiratory disease in industry, and the deduction is drawn that the worst respiratory mortality is associated with dust and particularly silica dust. Extreme heat with sudden variations in temperature and exposure to weather are also shown to be injurious.—An inquiry is described by J. Meyers into the hazard of benzol poisoning arising from applying paint by spray. Abnormally low leucocyte counts, characteristic of this poison, were found in 29 per cent. of the men examined, while in 21 per cent. the spleen was palpable, an unexpected observation.—The occurrence of phosphorus necrosis in America is reported by E. F. Ward in the manufacture of fireworks. At three factories, among 56 females employed, 14 cases, two of which were fatal, were discovered. Some of these horrible cases are described and figured. Discontinuance of the use of yellow phosphorus is now promised by the trade. It should be prohibited by Federal Law, as in the case of matches.

diseased viscus, it should follow that when the cutaneous afferent impulses are blocked by intradermal injections of novocaine, the referred pain will be abolished. If the pain is visceral in origin it should persist after the injections, and if visceral and referred pains are both present, the composite pain should be reduced proportionately to its referred element. They found in many forms of visceral disease that if the pain was sufficiently localised, it could be greatly lessened after infiltration of a small area of skin with novocaine. Sometimes after the cutaneous afferent impulses had been blocked, certain unpleasant sensations—but not definite pain—were experienced, and these WEISS and DAVIS regard as true visceral sensation. They suggest that the analgesic effect of paravertebral injections ostensibly designed to infiltrate the rami communicantes of the sympathetic chain is really due to blocking of cutaneous impulses going to the spinal cord; and, further, that infiltration of the skin with novocaine is a practical therapeutic measure in some pathological conditions associated with localised pain.

THE LIMITATIONS OF SANATORIUM TREATMENT.

IT is written that those who are whole have no need of the physician, but only the sick. The practice at certain sanatoriums would suggest an inversion of the text, for the patient with the demonstrable signs of disease is not wanted. It is therefore refreshing to read of an institution where all sufferers from pulmonary tuberculosis are equally welcome. Dr. P. C. Varrier-Jones,[1] in the annual report of the Papworth Village Settlement, makes it clear that his institution is not reserved for the treatment of the so-called early case. On the contrary, his object is to provide for permanently damaged lives, for "substandard men and women who cannot be employed in the industrial and commercial world." He is much more concerned with the need of the sufferer than with a reputation for miraculous cures. We are frequently told that the early case of pulmonary tuberculosis is eminently curable. This is one of those half-truths from which false deductions are constantly made. If the patient possesses a fair natural resistance, if he can command all the conditions necessary for complete repose of body and mind, if he has sufficient intelligence to understand and sufficient determination to follow the method of life necessary for a cure his prospects are hopeful. For the average industrial worker smitten with tuberculosis the prospect is well-nigh desperate. It is perhaps unnecessary to add that we are not referring to the early case whose sputum has never revealed the tubercle bacillus, to the tuberculous ex-Service man whose disease begins and ends in a series of dossiers and record cards, nor to the rare abortive types of disease whose course is self-limited whether treatment be given or withheld.

The current teaching concerning the early case involves a fallacy. The onset of pulmonary tuberculosis in the adolescent and young adult is usually rapid, and the incipient stage may give rise to neither symptoms nor physical signs. The patient has had a clean bill of health and even a routine skiagram may have shown no abnormality within a few weeks of the outbreak of serious disease. It is noteworthy how often the young patient states that the first symptoms immediately "followed an attack of influenza." Within a few weeks of the onset the sputum is loaded with tubercle bacilli, physical examination detects widespread disease, the skiagram reveals abundant areas of mottling and hazy opacities below the clavicles or external to the root shadows. It is true that modern methods of treatment, notably collapse therapy combined with a prolonged period of careful supervision, may result in permanent arrest of disease that otherwise would prove fatal. The fact is attested by records of notification and death that a majority of consumptives die within a few years after the onset of symptoms of ill-health. For those who return from a sanatorium to unfavourable home conditions the outlook is almost hopeless. When in the annual report of a well-known sanatorium we read that 85 per cent. of the early cases were discharged "fit for work" and 48 per cent. of all cases discharged were in a similar happy condition, we can only infer that diagnosis has been at fault or that cruel disillusionment awaits those who return to office, factory, or field. It is noteworthy that the report contains no reference to sputum examinations.

It is common knowledge that pulmonary tuberculosis in the middle-aged tends to run a chronic course. The sufferer from fibroid phthisis usually remains at work for long after the disease has become firmly established. But a time comes when increasing cough and loss of strength drives him to panel doctor or tuberculosis dispensary. The response to sanatorium treatment is gratifying, symptoms decline, the patient gains in weight, the temperature remains normal despite increasing exercise, and at the end of a few months' treatment he is discharged. Return to work is followed by a recurrence of symptoms—and so back to the sanatorium. The records of the dispensaries tell a tragic story of wasted effort and frustrated hope. The Ministry of Health has often stressed the need for the after-care of those discharged from sanatoriums, and this is emphasised once again in that section of the report of its Chief Medical Officer which is devoted to tuberculosis (see p. 1313). After-care, which is confined to occasional calls by a health visitor, occasional examinations at the dispensary, occasional doles from charitable committees, is futile. It is notorious that the consumptive cannot hope to find work in the open market. Yet without work he will be reduced to penury and despair. Meanwhile his family must be exposed to massive infection at a time when poverty is undermining health, and in due time a similar tragedy will be repeated in the next generation.

The village settlement with its ideal homes and sheltered trades, with its hospital wards and sanatorium where those who relapse can receive all that medical skill can effect, separated from and yet in touch with their friends, is the most hopeful experiment yet made on behalf of the tuberculous. At Papworth and Preston Hall the experiment has proved a notable success. Two arguments may be adduced against an extension of the system to other areas in the country. In the first place, schemes of this kind are very costly and require lavish endowments, and in the second, previous experiments in treatment and training elsewhere have failed. The average consumptive lacks persistence and fails to achieve the self-discipline without which restoration of working capacity is impossible. The financial difficulty is perhaps not insuperable, and with regard to the personal factor, while admitting that only the brave and determined can hope to overcome the disabilities of chronic ill-health, we may well ask ourselves whether two institutions suffice to meet the needs of all those who are both willing and able to work if work is adapted to their strength. Are we content to leave such in the dungeons of Giant Despair?

[1] Reports of the Committee of Management and Medical Director of the Papworth Village Settlement for 1927.

VISCERAL PAIN.

WHETHER the internal organs can feel pain is a question that has long given rise to controversy. The doctrine that they have no such sensibility seems contrary to common experience and strikes the man in the street as absurd; if he has abdominal colic he feels pain inside him, quite apart from any additional sensation referred to the body wall. Yet this same doctrine has been current for a long time. As far back as 1763 HALLER concluded that there was no evidence that the viscera were sensitive to painful stimuli, and though his views were ignored until operations came to be performed under local anæsthesia, the conception of referred pain was quite well known in England about the middle of the last century. HILTON, for instance, in 1863, suggested that superficial pain in visceral disease might be due to a central connexion between the visceral sympathetic nerves and the peripheral sensory nerves; MARTYN, in 1864, said that reflected or radiated pain was then recognised as extremely common; and in 1888 ROSS advanced the theory that there were two kinds of visceral pain—namely, the splanchnic, which was felt in the organ itself and the somatic, which was referred to the body wall. HEAD and MACKENZIE, working independently, suggested about the same time that nearly all pain in visceral disease is really felt in the superficial structures of the body. HEAD differed from MACKENZIE in that he believed that, although visceral pain was nearly always referred, there was also a low form of protopathic pain which was in reality true visceral sensation. MACKENZIE, with his flair for bold outlines, maintained that the internal organs had no pain sensibility whatever. LENNANDER, in 1901, traced the pain of abdominal disease to an extreme sensitiveness of the parietal peritoneum and of the subserous connective tissue, whilst MACKENZIE subscribed to the view that the subserous connective tissue was sensitive, but held that all serous membranes, including the pleura and pericardium, were devoid of pain sensibility.

Most observers agree that the viscera are insensitive to such stimuli as touching, squeezing, cutting, and burning which produce very definite sensations when applied to the skin and body wall. The concept of referred pain in visceral disease is also generally accepted. The explanation for divergence in views on visceral pain and sensation is probably to be found in the teaching of the physiologists that for each type of sensation there are specific end-organs, nerve paths, and sensory receptor cells in the thalamus and cortex cerebri, and further, that each type of sensation is produced by the application of a specific and "adequate" stimulus. This specificity of the sensory mechanism has been evolved and adapted to meet the needs of each part of the body and of the organism as a whole. The senses of touch, of heat and cold, taste, and hearing all have highly specialised nerve-endings, coördinated nerve paths, and receptor cells. The internal viscera are carefully insulated; t is to say, they are normally not called upon to nd to such stimuli as those which set up the al sensations and reflexes in relation to the r covering of the body, thus bringing the indiual into relationship with the outside world. LENNANDER and MACKENZIE, in their experimental work, applied to internal organs the stimuli which cause pain when applied to the superficial structures of the body, and found, as in LENNANDER's classical experiment on the liver and gall-bladder, that such stimuli as cutting, scratching, squeezing, and burning did not evoke pain in the viscera. But, in so doing, as A. F. HURST pointed out, they failed to apply the adequate and specific stimulus. J. A. RYLE says that the stimulus required to produce pain in a hollow viscus is tension in the muscular element of its wall. He maintains that the increased tension results either from exaggerated contraction of the muscle-fibres or from their failure to relax adequately when intravisceral pressure increases; further, he holds that visceral pain when occurring alone or dissociable from attendant referred pains may be accurately localised by the patient. He regards persistent referred or somatic pain and hyperalgesia as an expression of organic visceral disease of an inflammatory nature.

It appears that tension is the specific stimulus to which nearly all the viscera respond, not only in the alimentary but in the respiratory and cardiovascular systems—a thesis illustrated by the tension theory of pleural pain recently advanced by H. A. BRAY of New York. Evidence is accumulating, too, that some forms of pain in disease of the lung are due to tension and distortion of the nerve-endings in the pulmonary parenchyma. Absence of pain has been noted when the nerve-endings have been destroyed, as in cavitation—a fact which was pointed out by HEAD in 1896. HEAD also showed that in lobar pneumonia the massive consolidation protects the nerve-endings from pressure from without or traction from within, and consequently that the pain in this condition is due entirely to involvement of the pleura. In bronchopneumonia pain may arise from the lung itself because the scattered patches of consolidation do not give the nerve-endings absolute immunity from ension. By applying the tension theory to angina pectoris POULTON, we believe, makes a valuable contribution which helps to unify the conceptions of visceral pain, as well as explaining satisfactorily the undoubted action of amyl nitrite as a therapeutic agent in this condition. His work with W. W. PAYNE leads him to suppose that all the sensations arising from the alimentary tract—such as nausea, sinking, and pain—probably have their specific end-organs. As regards the exact mechanism by which tension in the alimentary tract produces pain, there is some difference of opinion between the views set out in the Oliver-Sharpey lectures and those of CHARLES BOLTON.[1] PAYNE and POULTON think that œsophageal pain results from a stretching force in the viscus, distorting the pain nerve-endings in the œsophageal walls. This pain, in their opinion, may be relieved either by peristaltic contraction which overcomes the stretch or by postural adaptation which increases the capacity of the organ so that tension is reduced. They say that pain more often occurs during the relaxation following a peristaltic contraction than during the actual muscular contraction. BOLTON rightly points out that it is hard to imagine that there is more tension during relaxation than during muscular contraction. They agree, however, on the essential fact, that visceral pain is due to tension.

The empirical use of counter-irritation for relief of pain receives a measure of scientific approbation from the work of PAYNE and POULTON, and in recent clinical studies WEISS and DAVIS[2] throw further light on it from a new angle. They point out that the relationship between cutaneous sensation and visceral function is probably reversible. If the conception of referred pain is correct and visceral pain is caused by normal afferent impulses from the skin entering a segment of the cord which has become irritable as a result of exaggerated afferent impulses from a

[1] THE LANCET, 1928, i., 1235.
[2] Amer. Jour. Med. Sci., 1928, clxxvi., 517.

Lund, was led to search for similar specimens in the various museums of Europe, with the result that 15 unreported examples were assembled. In examining the post-mortem records he was impressed by the frequency with which the cerebellar cyst was associated with angiomatous and cystic lesions in other parts of the body. The lesions found included cysts of the kidneys and pancreas, adenoma of the adrenal gland, and angiomatous tumours in other parts of the nervous system. In one case it appeared that the patient had had one eye removed eight years before death for what was diagnosed as arteriovenous aneurysm of the retina. The eye had been preserved, and when it was cut and examined histologically a small capillary angioma of the retina was discovered. By this interesting disclosure Lindau was encouraged to study angiomatosis of the retina, a rare malady with a familial tendency, and he found that approximately 20 per cent. of the patients suffering from this condition had been known to have intracranial complications. Since the publication of Lindau's paper several additional cases have been reported in which cystic hæmangioma of the cerebellum was associated with cystic and angiomatous lesions in other parts of the body. Cushing and Bailey[4] re-examined the eyes of six cases of hæmangioma of the cerebellum that had been operated on at Cushing's clinic in previous years, and in one of these cases they found an unmistakable angioma of the retina that had been overlooked at previous examinations. Detailed inquiry by Fulton into the family history of this patient disclosed that the father and one aunt had died of "ruptured cystic sarcoma" of the brain.

The discovery of angioma of the retina in a patient who is suspected of suffering from intracranial tumour may now be said to have a distinct significance; it suggests that the patient has a cystic hæmangioma of the cerebellum, a benign lesion that can be removed at operation. As Cushing's case shows, the retinal angioma may be overlooked. It usually lies in the peripheral part of the retina, and it may give rise to changes, such as cyst formation, detachment of the retina, hæmorrhages, and retinitis proliferans, all of which render the primary lesion obscure. Fortunately, however, the retinal vessels passing from the optic disc to the tumour are excessively enlarged, and the artery often has a varying calibre. Such appearances call for careful examination of the peripheral retina.

Although the observations are still few in number, there is little doubt that Lindau's syndrome is an hereditary affection. Hitherto the information that any disease is hereditary has usually come from patients whose sphere of observation is limited to diseases, such as hæmophilia, that are easy of recognition. Among diseases that cannot be diagnosed by lay observers, there must be many in which heredity plays a part, and it is legitimate to expect that the more accurate pathological investigation and documentation of cases during recent years will furnish, as records accumulate, more and more evidence of the influence of heredity in disease.

HOOKWORM INFECTION IN THE STRAITS SETTLEMENTS.

A REPORT[5] has lately been made by Dr. P. F. Russell on work done during 1925–26 in determining the degree of infection with nematodes, particularly with hookworms, in the Straits Settlements. The method of diagnosis was by Willis's salt floatation technique; the covering slide, measuring 3 by 2 in., was reversed before examination, random sampling of 20 scattered fields was made, and the eggs in them counted. It is significant that in these preparations distribution of ova is apt to be irregular, while the eggs lost in reversal have been found to vary between none and three-quarters of the total which originally hung from the slide. It is then clear that Russell's statement that the method is less accurate than certain others is well founded; yet it is claimed that it suits the local microscopist, since it demands neither precision of movement nor unremitting attention, that it forms a reliable and useful guide to intensity of hookworm infection in groups of people, and that egg-counts can be made at the rate of 50 specimens daily. On the basis of these counts stools are, necessarily arbitrarily, graded into groups with 10, 30, 60, and more than 60, in 20 fields. Fifty specimens being taken as the daily limit of work possible for one local microscopist, it is calculated that to reach Clayton Lane's claim, that by the use of direct centrifugal floatation (D.C.F.) diagnosis can be made at the rate of 250,000 specimens a year for each centrifuge, 20 full-time dressers would be needed for diagnosis alone, whereas there have never been more than five in the Straits Settlements for all work. There is misunderstanding here, for Lane's method of mass diagnosis discards all counting as being unnecessary. Estimation of numbers of eggs can be carried through incidentally in D.C.F., but if this is rejected as unnecessary his mass methods would, he believes, allow of diagnosis at the rate mentioned by four men, only two of them being microscopists.

Russell's practical experience of anthelmintic treatment in the field pits itself against the rather academic suggestions of Lamson and others[6] for the immediate treatment of carbon tetrachloride poisoning. Russell urges prompt emesis and purgation with stimulant and symptomatic treatment, while as a precaution purgation must always be effected within three hours of taking this anthelmintic. The treatment advised for general use is a mixture of carbon tetrachloride (2 to 2·5 c.cm.) and oil of chenopodium (1·5 c.cm.). The criteria for the identification of hookworm larvæ are admirably put in Russell's paper. Mass treatment without coincident soil sanitation is likened to bailing a sieve-bottomed boat, universal use of a sanitary latrine constituting the only hope of eradicating infection. Yet mass treatment, it is pointed out, has two real advantages. The seeing of worms in his own stool is apt to stir the most lethargic to an interest sufficient to drive him to provide a latrine for himself and his family. Secondly, heavy infection, individual and general, is reduced, and this gain may perhaps be held until soil pollution is controlled.

THE AMBULANCE.

FROM every side, with every week, comes fresh evidence of the steady trend of the sick from home and home care to the hospital. We reviewed in our issue of last week the opinions expressed by Mr. R. G. Hogarth on the future of paying annexes to all general hospitals, and the proposed amendment in the poor-law is going to thrust on the local authorities of every district a large number of hospital beds, not all of which need be kept for the destitute sick. Everybody concerned is drawing up policies and expressing opinions, but the essential intermediate link between the "hospital case"—the patient who is ill enough to need removal to an institution—and the institution he is to seek for restoration to health is often forgotten altogether. That link is the ambulance. The sick person of the middle classes sends first of all for his doctor to come to his own house, or visits a neighbouring surgery. By the time he is diagnosed as really ill he is seldom in a fit state to walk or travel by 'bus to the hospital, and grave harm has been done by dressing a prostrate patient and huddling him into an ill-sprung and draughty taxi for the journey. A smooth running vehicle built for the purpose of conveying the sick is the only suitable way of connecting the patients' home with the hospital. We have had welcome evidence that since we commented some six months ago (THE LANCET, 1928, i., 1210) on the need of improvement in the body-work and engine of the type of vehicle used, attention has

[4] Cushing, H., and Bailey, P.: Archives of Ophthalmology, 1928, lvii., 447.

[5] Malayan Med. Jour., September, 1928, p. 113.

[6] Lamson, P. H., Minot, A. S., and Robbins, B. H.: The Prevention and Treatment of Carbon Tetrachloride Intoxication, Jour. Amer. Med. Assoc., 1928, xc., 345.

Annotations.

"Ne quid nimis."

THE SKELETON OF ERASMUS.

Desiderius Erasmus was born at Rotterdam in 1467, the illegitimate son of a physician's daughter, by Gerard of Tergon, who later became a monk, and the last 15 years of his life were spent at Basle, where he died in 1536. Last June his tomb in the cathedral was opened owing to the construction of a new system of central heating, and on Oct. 19th the bones were restored to their original place. In the interval they were subjected to a close study by Dr. A. Werthemann, of the Pathological Institute of Basle University, and the results were laid before the Basle Society of Natural Sciences at its meeting on Dec. 5th. The circumference of the skull measured 50·5 cm., its capacity 1255 c.cm., corresponding to a brain weight of 1200 g. This weight is small considering that the average weight in Caucasians and Chinese is something over 1300 g. That the man who stands for all time as the supreme type of cultivated common sense applied to human affairs should have had a brain smaller than the average demonstrates once again that quantity of brain substance has not the importance generally attributed to it. From the measurements of the long bones the height of Erasmus during life was calculated at 173 cm., say 5 ft. 8 in. On the left ulnar bone and on the left tibiæ a thickening was found, parts of which were examined microscopically, and diagnosed as of unquestionably syphilitic origin. The syphilitic disease of Erasmus is of the acquired type; no sign of hereditary syphilis was found. The fact of syphilisation is not in itself very astonishing. Whether or not the disease was introduced into Europe only after the discovery of America—i.e., several years after his birth—there is little doubt that in the lifetime of Erasmus syphilis had the character of a pandemic disease which was carried in many other ways than by clandestine sexual intercourse. Erasmus is credited with a constant fear of infectious diseases, and in his writings he advocated prohibition of marriage for diseased persons. It seems that he recognised the nature of his own condition, for in a letter to his friend Beatus Rhenanus, dated 1518, he described symptoms which can be interpreted as those of syphilis. Dr. Werthemann has no doubt of the identity of the bones after a careful comparison of the skull with the portraits of Erasmus by Holbein.

A SIDELIGHT ON PUBLIC HEALTH IN INDIA.

It occasionally happens that a useful light is thrown on conditions in India by visitors with little or no experience of the country, and Dr. Hoops's report on the League of Nations interchange of health officers[1] which took place in India last December and January is well worth notice. The report emphasises that public health in India is mainly a rural problem, and Dr. Hoops considers that the crux lies in the villages, where, as he says, 90 per cent. of the population live, and where there is at present no settled local organisation to deal with sanitation, water-supply, and elementary medical aid. He justly remarks that the breakdown of the *panchayats* (village councils), which has been one of the results of British administration, has left the rural population worse off in some respects than they were in ancient times, and he evidently thinks that the true interests of the country lie in the revival of these village authorities. This line is, in fact, being explored in the Punjab district of Gurgaon, and the delegates were much interested in an experiment that was being conducted there by an enterprising district officer who has succeeded not only in improving the agricultural methods and reviving village industries, but also in getting the villagers to clean up their surroundings, to admit light and air to their houses, to improve and regulate their water-supply, and even to undergo inoculation for plague and cholera, when considered desirable, in addition to the customary vaccination for small-pox. Such work is of supreme importance in a country like India, and Dr. Hoops is perhaps not unduly optimistic when he hazards the opinion that if a similar advance could be made in other districts the problem of rural health could be solved in a generation.

At the Calcutta Congress of the Far Eastern Association of Tropical Medicine, which the delegates attended last December, the recent work on kala-azar and the paper of d'Herelle on bacteriophages must have been of exceptional interest to them. Thanks to the labours of Napier, Knowles, R. O. Smith, Acton, Shortt, and others, the diagnosis and treatment of kala-azar have been so much improved that the 90 per cent. mortality which formerly prevailed has been converted into something like 90 per cent. of cures. This has, incidentally, been an excellent example of team-work, the honours being divided between the field workers in Assam and the laboratory and hospital men in Calcutta. With d'Herelle's work on bacteriophages we have recently dealt.[2] In dysentery and cholera particularly, both from a prophylactic and therapeutic point of view, the results obtained by the discoverer seem very encouraging. The bacteriophage phenomenon is at all events a most interesting biological fact, and if the hopes of d'Herelle are realised the employment of the appropriate bacteriophages in these diseases will mark a very important epoch in tropical medicine. The delegates were struck with the apparent neglect in India of drainage and other measures of mosquito destruction in antimalarial work, and this, it must be admitted, is a weak point. It is, after all, largely a question of funds, but money could hardly be better spent, and larger grants for these purposes would be amply justified by a diminished sick-rate. Attention is drawn in the report to the good effect on the general condition of the people of extensive irrigation works, and the author evidently thinks they more than counterbalance any increase in malaria, even from the public health standpoint. These observations support the contentions of C. A. Gill, who in this province has argued for some years past that the factor of general prosperity and good nutrition is one of the most important considerations in the control of malaria.

As regards general public health organisation in India, the report gives a summary of the present position, but, naturally perhaps under the circumstances, no comment is made. The fact, however, emerges that there is a somewhat excessive tendency towards decentralisation. This, no doubt, is inevitable at the present juncture, but the movement is not without its dangers. Popular government is advancing more rapidly at the periphery than the centre, and it is open to doubt whether an elected provincial council will be as ready to provide funds for purposes of this kind as it should. International considerations—including the Health Organisation of the League of Nations—will bulk more prominently in the future than they have in the past, and the central government will be well advised to maintain a general control, particularly as regards such questions as quarantine, international health legislation, research, and education.

HEREDITARY ANGIOMAS OF THE CEREBELLUM AND RETINA.

Recent work on cystic hæmangiomas of the cerebellum has brought to light a clinical syndrome that has hitherto received no general or accurate recognition. From a pathological study of two cystic hæmangiomas of the cerebellum Lindau,[3] of

[1] A Report on the League of Nations Interchange of Health Officers in India. By A. L. Hoops, M.D., D.P.H. London: John Bale, Sons and Danielsson, Ltd. Pp. 80. 5s.

[2] THE LANCET, Nov. 17th, p. 1031.

[3] Lindau, A.: Acta Path. u. Microbiol. Scand., 1926, Suppl. 1.

mental disorders as it might affect general hospitals. The latter is a well-considered scheme for approximating the treatment of early mental illness to that of physical disease; it deals with out-patient clinics, in-patient accommodation, annexes and hostels, and gives valuable advice on the requirements of these "service units." The Council has a great opportunity, now that a large number of poor-law hospitals are likely to be freed from their trammels, of influencing their reorganisation in the right direction. The movement is progressing in the British Dominions, and a scheme is on foot for founding a similar association in India. Another of the Council's activities is the attempt to secure a better place for psychiatry in the medical curriculum, and correspondence to this end has taken place with the General Medical Council.

The Council's aims are well summarised in a sentence in the report: "There is nothing spectacular about the work of the Council, which of its very nature must be slow and to a large extent unnoticed; yet if little by little it can break down the wall of doubt and prejudice which still surrounds mental ailments and can give to the public a knowledge of the resources at its disposal in combating such illnesses, and of the hope which characterises modern methods of treatment, the National Council for Mental Hygiene will have fulfilled an important part of its mission."

The popular course of lectures, which is to be held on Wednesdays during the early months of 1929, includes addresses on Dangerous Ages, Irresistible Impulse, and the Problem of Nervous Breakdown.

ENCEPHALOMYELITIS FOLLOWING MEASLES.

THE rarity of nervous complications of measles has not prevented, in fact has probably favoured, acute controversy as to their nature and origin, few cases having been available for clinical and pathological study. During the first 20 years of the present century only five cases of encephalomyelitis following measles were recorded, though some 20 million children in the British Isles must have contracted measles during that time. Since 1920, however, the incidence has increased, especially abroad, but even so it is rare for any author to have observed more than two cases. In this country a case was recorded by C. R. Box in 1921 [1] and by Winnicott and Gibbs in 1926.[2] Dr. J. G. Greenfield, speaking at the Neurological Section of the Royal Society of Medicine on Dec. 13th, commented on the cases previously recorded and described three which had come under his notice in the spring and early summer of this year. Two of the cases in which he examined the cerebro-spinal fluid were cerebral, one being spinal. No post-mortem examinations where allowed, though only one of the three patients recovered, but in another fatal case he was able to examine the brain. The clinical features in these cases coincided with those described by other observers. The cerebral type is ushered in by a recrudescence of fever, often with convulsions. Delirium, muscular twitchings, and loss of speech are often noticed. But the most constant and characteristic symptom is profound drowsiness or stupor, which is usually associated with neck rigidity, head retraction, or tache cerebrale, and often with rigidity of all the muscles of the body. Kernig's sign is also often present. The convulsions may be so severe and frequent as to lead to the death of the patient, but more often death is directly due to lung complications. The mind gradually clears, and with the return of consciousness a varying degree of damage to the brain may manifest itself in such changes of character and temperament as irritability, tendency to use bad language, and dirty habits. Usually this phase is of quite short duration, a couple of days or a week or two at most. With further recovery there is often remarkably little evidence of cerebral disturbance, but sometimes there is permanent mental backwardness. The majority of the patients have recovered completely in the course of three or four months. In the spinal type paraplegia with loss of sphincter control is the most characteristic symptom. The paralysis is sometimes of an ascending type, and is often accompanied by sensory loss, either to all forms, or, perhaps more often, to pain and temperature only. The paraplegia of measles thus differs from poliomyelitis in the constancy of severe sphincter paralysis, in the presence of sensory loss, and in the tendency for signs of pyramidal involvement, such as Babinski reflexes and hypertonicity, to appear after the acute phase has passed off. The degree of recovery is remarkable, and usually very little residual paralysis is left behind. In many cases cerebral and spinal symptoms are equally prominent and it is impossible to classify the cases. The abnormalities of the cerebro-spinal fluid are very variable. The pressure is often moderately raised in the cerebral form up to 300 mm., but is little altered in the spinal form. On the other hand, the cell count tends to be higher in the spinal form. As to morbid anatomy, the changes in the nervous system described by Barlow and Penrose were confirmed by Dr. Greenfield in his case. The changes are evenly distributed throughout the cord but are of greater intensity in some regions. In addition to great engorgement of the vessels and some scattered petechial hæmorrhages, many of the vessels are surrounded by a zone of coagulated exudation, and beyond this for a considerable distance the tissues are infiltrated with leucocytes giving the appearance in transverse sections of a series of concentric rings. No changes were found in the nerve cells. This appearance of perivascular softening with cell exudate forming a concentric zone round the vessels has also been found by Siegmund in a case of Brock's and by F. Wohlwill.[3] The most characteristic change is the zone of demyelination of greater or less width around many of the small veins. In Wohlwill's cases, however, and in Brock's there was practically no mesodermal reaction, and this variability of mesodermal reaction seems to have led to considerable confusion. The question has been raised whether it is possible to have a form of inflammatory disease of the brain in which there is no evidence of cell exudation, and certain observers have considered that the changes found in the encephalomyelitis of measles are of a purely degenerative character and are not inflammatory. But in view of the acute febrile onset of the nervous complications, the high pressure of cerebro-spinal fluid and papillœdema sometimes present, and the congested and sometimes hæmorrhagic appearance of the brain and cord, Dr. Greenfield finds that the cardinal evidences of inflammation are present.

It seems to him likely, in fact, that cell exudation is caused not by the presence of virus or toxin so much as by the effects they produce on the tissues. The presence of diphtheria toxin or tetanus toxin in the nervous system calls forth no cellular reaction, but far from being absent, it is just their presence in the nervous system which causes the symptoms of paralysis or spasm. Similarly, in demyelinating diseases such as disseminated sclerosis and Schilder's encephalitis there may, or may not, be perivascular infiltration; it is not an essential part of either disease. What is a still more cogent argument is that in post-vaccinial encephalomyelitis, which resembles measles encephalomyelitis very closely, there may be remarkably little evidence of mesodermal reaction, or it may be confined to a very small proportion of the affected vessels. The similarity of the disease to post-vaccinial encephalomyelitis is seen not only in the morbid anatomy, which closely resembles that originally described in the post-vaccinial affection by McIntosh and Turnbull and later by Pendrau. There has been a great increase in the incidence of both

[1] THE LANCET, 1921, i., 222.
[2] Brit. Jour. Child. Diseases, 1926, xxiii., 107.
[3] Zeit. f. d. ges. Neur. u. Psych., 1928, cxii., 20.

been paid to these points in many districts. The ambulances in the fleet of the Home Ambulance Service of the British Red Cross have always been comfortable and well-sprung. This invaluable servant of the community now has 352 fully-equipped motor vehicles at various stations scattered throughout the country, and the new Register, just published,[1] gives their locations in alphabetical order, and the address and telephone number of the officer in charge. It is a reference book that every country practitioner should possess. Its foreword outlines the history of the movement from the end of the war, when a large number of the Society's ambulances were still able to answer the roll call and be handed over to civilian needs. The British Red Cross Society and the Order of St. John of Jerusalem wisely decided that the call for united service did not cease with the war, and seized this opportunity to organise a fleet of rural ambulances. The vehicles are staffed by well-trained volunteers who are willing to leave their trade or business by day or by night at the call of the sufferer needing transport. Moreover, all collecting, organising, and responsibility connected with the upkeep is carried out by voluntary effort, so that the Society is able to charge a fee within the means of the patient, and to transport for nothing those who cannot afford to pay at all. A football match, a carnival, a procession, would all seem incomplete without its blue-uniformed ambulance men, but few people remember, as the familiar figures pass by, that these are shopkeepers, miners, clerks, and professional men who accept no material reward for their loss of business or leisure or for the hours they spend in initial and renewed training.

The need increases every day, and the report for the quarter ending Sept. 30th last shows that 2852 road accident cases alone were carried in the ambulances, the total number of patients moved being 705,219. The Joint Council can now state that the country is so thoroughly equipped that every part of it can be reached within a reasonable time. It is a reproach to the counties that it should go on to say that there is as yet no universal appreciation of the extent of the support that can be obtained from the public if they are approached systematically. The county areas are given great latitude in organisation and they ought to be very nearly self-supporting. Those that have not yet found out how to do it will be wise if they get their arrangements on a satisfactory basis before the increasing demand for transport of middle-class patients to hospital tempts some commercial concern to snatch from them the fees of their less impoverished clients, and thus prevent them from helping those who cannot afford to pay.

[1] Home Service Ambulance Committee, 19, Berkeley-street, London, W.1.

MALPIGHI.

LONDON has had many medical centenaries to celebrate this year, but it would have been a grave omission if she had failed to remember with honour the "father of microscopy," for Marcellus Malpighi had a close connexion with our own Royal Society. The tercentenary of his birth at Crevalcore, near Bologna, on March 3rd, 1628, was celebrated at the Royal Society of Medicine, under the auspices of the Historical Section, on Dec. 12th. The Royal Society had loaned a portrait in oils as well as a splendid collection of drawings from his pen, and other items from the Royal Society of Medicine's own collection and from the Wellcome Historical Medical Museum made up an exhibit fit to form the text of a memorial address from Prof. Giuseppe Franchini of Bologna. Malpighi's work was encyclopædic; he was an able legatee of the wonderful heritage left to him and his contemporaries by the revival of scientific learning and the discovery of the microscope. He investigated the development of the chick and described the formation of many of its organs; he studied the anatomy of plants and was familiar with their cellular structure and stomata; he gave accurate accounts of the germination of many seeds; he discovered the organs of taste and touch, and he published illuminating works on the internal organs of man. One of his most striking pieces of work was on the silkworm, and this he dedicated to the Royal Society, by which it was printed. He is memorable for completing the work of Harvey by his discovery under the microscope of the capillary vessels linking the arterial and venous systems. Perhaps of all his work, that on the brain was the most interesting, for he transformed it from a spongy secreting gland into a complex organ made up of little grey and white bundles. He believed, however, that the cortex was glandular and described the grey matter as hanging on the white bundles "like dates on a palm." He is commemorated in the nomenclature of the histological structure of the kidney, which he described—among others organs—in a treatise published in 1666 and entitled "De viscerum structura exercitatio epistolica." Malpighi had the receptive mind which so strongly marked John Hunter, Louis Pasteur, and other eager investigators. He idly plucked a branch from a chestnut tree and immediately the vascular bundles caught his eye, and the end of that was "The Anatomy of Plants." His description of the circulation in the gills of the tench was the outcome of another casual event. He was inexhaustible in the pursuit of knowledge, and was an exquisite draughtsman. If he failed it was in interpretation, and indeed some of the structures he depicted quite clearly have had to wait until modern times for their explanation. The work forms a curious link between the old days and the new; his microscopical research links him to our own times, yet Malpighi, as Prof. Franchini reminded his audience, lived in the days when lessons on anatomy had to be held in private houses on mouldering scraps of corpses snatched from funerals or rescued from new-dug graves at the risk of attack from relatives, guardian monks, vultures, or hungry dogs. His contemporary and friend, Bellini, was stoned by the students of Pisa, and hay and straw were hurled at the professors of Paris. Malpighi did not escape, for his colleagues incited his students against him, even to threatening his life. He was a mild and prudent man and greeted opposition with silence and magnanimity. Fortunately he lived to see his fame acknowledged; a monument was erected to him by the people of Bologna in the university building. Later the monuments, memorials, and medals in his honour became legion, and Prof. Franchini was able to show more than two dozen photographs of these indications of popular admiration. Malpighi married Francesca, the daughter of Massani, in whose house, while still a student, he had joined a "corus anatomicus" for dissection and discussion. She died a few days before him, thereby accelerating his end. From pains in his head he prophesied quite correctly his death from an apoplectic stroke which took place at the age of 66. An autopsy on his body was made by Baglivi, and only this year Prof. Franchini opened his coffin to investigate what remained of the great microscopist. All but the large bones and the vault of the skull had turned to dust.

MENTAL HYGIENE.

IF civilisation is to be preserved from the ill-effects of increasing stress, the care of the mind must become part of the training of every citizen. No organisation works more energetically towards this end than the National Council for Mental Hygiene, which completed its fifth successful year of existence last week. Its chief concern during the year was propaganda. Several local representatives have been appointed and a considerable number of meetings have been held, at which educative lectures have been delivered; a large public meeting is contemplated and a course of popular lectures on mental hygiene is to be given at the rooms of the Medical Society of London. The Council has become affiliated with the National Council of Women of Great Britain. Its report contains two valuable memoranda as appendices, one on child guidance and the other on the early treatment of

Modern Technique in Treatment.

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CCLXXXVII.—THE TREATMENT OF ACUTE HÆMATOGENOUS OSTEOMYELITIS.

BACTERIA may gain access to a bone directly through an external wound as in a compound fracture, or from a nearby focus in the soft parts; or indirectly through the blood stream from a distant primary focus (hæmatogenous osteomyelitis).

Acute hæmatogenous osteomyelitis is mainly an affection of youth, with its greatest incidence in the male sex between the ages of 2 and 15. The disease has become comparatively uncommon in recent years. The primary source of infection may be (*a*) in the skin—e.g., an abrasion, a crop of boils, or, in infants, umbilical sepsis; or (*b*) in the upper respiratory tract—e.g., tonsils, teeth, or sinuses. In not less than 75 per cent. of cases the responsible organism is the *Staphylococcus pyogenes aureus*. The streptococcus is found in about 10 per cent. of cases, and more rarely organisms such as the pneumococcus or *Bacillus coli* are isolated in pure culture.

Site.—The blood-borne infection is usually arrested in one of the long bones—the upper end of the tibia, lower end of the femur, lower end of the tibia, and upper end of the humerus being the sites of election. The flat bones are less frequently involved, but pelvic osteomyelitis is seen from time to time. In grave infections multiple foci may develop. Injury may play an important part in localising the lesion to a particular region.

Origin and Spread of Osteomyelitis.

In the *growing bone* the osteomyelitic lesion almost invariably begins in the cancellous tissue beneath the epiphyseal disc (metaphysis), a region where the end artery system and the sluggish blood stream favour the lodgment of infective emboli. From the tiny juxta-epiphyseal focus, spread may occur in various directions, but occasionally the lesion remains encysted for some days or even weeks. The earliest and most important line of spread is directly towards the surface. The pus having reached the subperiosteal space, tracks downwards along the shaft owing to the ease with which the periosteum strips. Longitudinal spread in the interior of the bone along the cancellous lining, and in the medullary canal itself, is a much later event. It is not unusual to find the whole shaft denuded, with the medullary canal still uninvaded. The attachment of the periosteum to the epiphyseal line presents a stout barrier to invasion of the neighbouring joint. In a minority of cases the infection reaches a long bone by the nutrient artery, and the initial focus develops towards the middle of the shaft (*diaphysis*). Spread then occurs in the interior of the bone in a proximal and distal direction.

In the *adult* long bone osteomyelitis may originate (*a*) in the middle of the shaft, or (*b*) in the cancellous tissue at the end of the shaft. In the method of extension certain differences are noted. When pus has reached the surface, the periosteum, which does not strip as easily as in the child, often gives way and allows widespread tracking of an abscess in the intermuscular planes. Occasionally the initial lesion becomes shut off by a zone of sclerosis with the ultimate formation of a chronic bone abscess—Brodie's abscess.

Reaction of Bone to Infection.—As the osteomyelitis spreads, its effects on the host bone are both *destructive and stimulative*. Destruction is signified by the amount of necrosis. But necrosis in the early stage does not necessarily imply the future separation of sequestra, for devascularised areas of cortex or cancellous bone may be integrated later in the shaft, as the infection becomes attenuated. This is part of the process of natural repair. The stimulative action of infection is well exemplified in the construction of the new case or involucrum under the periosteum, a bony shell which may ultimately house fully matured sequestra. Such extensive sequelæ are seen only in neglected cases when the infection has spread far beyond the limits of the original juxta-epiphyseal focus.

Symptomatology.

In many cases there is a *prodromal phase* before the typical clinical picture is established. This insidious mode of onset may last from seven days to two or three weeks, and is more usual in older children or adolescents. Important symptoms are a vague feeling of "seediness," intermittent limp, fixed pain at the end of a long bone, and on local examination metaphyseal tenderness. This clinical stage corresponds to the stage in which the juxta-epiphyseal focus has not reached the surface, and it is at this stage that diagnosis should often be possible. In other patients, especially in infants and young children, the prodromal phase is fleeting or unrecognisable, and the local and general symptoms are ushered in abruptly.

In the *early stage* the general symptoms are those of an acute infection, mild, severe, or fulminating in type. A rigor may occur at the onset, and the temperature often rises to 103° or 104° F. The fixed pain and the metaphyseal tenderness become more insistent, and now actual bony swelling is recognisable. The latter sign indicates that the infection has reached the subperiosteal space.

Later considerable swelling with œdema and redness of the skin may be present, and where rupture of the periosteum has occurred the fluctuation of an abscess may be detected. A moderate effusion into the neighbouring joint is not uncommon, but the joint movements remain free and painless. In fulminating osteomyelitis the clinical picture of acute septicæmia may overshadow the local signs, and in exceptional cases death may take place in two or three days from the onset. In the average case with severe toxæmia a blood count will usually show a marked leucocytosis, and a culture may demonstrate the presence of the staphylococcus or streptococcus. The symptoms of a systemic infection usually abate when the pus escapes from tension, either spontaneously or after surgical drainage.

Diagnosis.

Since the diagnosis of acute osteomyelitis is rarely made in the early stage, the mortality of the disease is far too high. Mistakes continually arise because the clinical syndrome bears a superficial resemblance to certain acute infective conditions. The more important of these are as follows:—

(*a*) *Acute Rheumatism.*—It is doubtful whether acute *monarticular* rheumatism exists at all as a clinical entity in childhood. Even if the possibility of such a disease be admitted, joint pain, joint tenderness, and muscular spasm present a very different picture from a painful, tender, thickened metaphysis. Such distinctions are appreciable if the affected region be carefully palpated.

(*b*) *Acute Cellulitis.*—In this condition there is early swelling and induration of the soft parts, skin redness, and the complete absence of localised metaphyseal tenderness and bony thickening.

(*c*) *Acute Infective Arthritis.*—In superficial joints, such as the knee or elbow, there is rarely the slightest difficulty in diagnosis. The differentiation between acute suppurative arthritis of the hip and acute osteomyelitis of the neck of the femur, is, however, a more difficult problem. In both conditions early exploration is demanded.

Special difficulties arise in the diagnosis of acute osteomyelitis of the deeper bones—for example, the pelvis—where the local signs may be masked. For this and other reasons pelvic osteomyelitis has an exceptionally high mortality. Suggestive signs of involvement of the pelvis are (*a*) referred pain in the lower limbs; (*b*) pelvic tenderness on rectal examination; (*c*) deep tenderness over the affected bone—e.g., between the iliac crest and the great trochanter, over the ischial tuberosity, or the pubis.

A radiographic examination only rarely affords information of value in the early stages. Occasionally where a juxta-epiphyseal focus has remained latent for some weeks a localised area of destruction may be visible in the radiogram.

In all doubtful cases exploratory puncture of the bone should be performed without delay. A small incision should be made down to the metaphysis, the periosteum incised, and the cortex drilled in several places. If pus appears appropriate drainage *should be established*. If no pus is found the material extruded from the drill holes should be sent for bacteriological culture, and the wound closed with

diseases during recent years; in both diseases also there is a definite delay of the onset of nervous symptoms till after the acute phase of the initial disease has passed off, and the time interval from vaccination or measles rash to encephalitis is remarkably constant. In Dr. Greenfield's opinion these facts confirm the suggestion that the virus which causes the encephalitis is not the same as that causing the exanthem, but is a special neurotropic virus which is stimulated to activity by the exanthematous disease. It is impossible to say, without further evidence, that the encephalomyelitis of measles is identical with post-vaccinial encephalomyelitis, but in the cases examined no clinical or pathological differentiation is possible. The relationship, if any, of these conditions to the other demyelinating diseases (disseminated sclerosis, diffuse myelitis, or Devic's disease, and Schilder's encephalitis) is also still unknown. In any case it seems to be established, both on clinical and on pathological grounds, that the typical lesion of the encephalomyelitis of measles is not a "hæmorrhagic encephalitis," but one of the diffuse perivascular demyelinating diseases closely related to post-vaccinal encephalomyelitis.

INTERNATIONAL HYGIENE.

THE Office International d'Hygiène Publique held its autumn session at Paris towards the end of last October, when a variety of epidemiological questions were discussed. We are indebted to Dr. Abt, the new director of the Office, for a short summary of the proceedings in advance of the elaborate procès-verbaux which will appear later in the *Bulletin Mensuel*. It is of interest that a permanent committee has now been formed, consisting of delegates of countries interested in the sanitary control of the Mecca Pilgrimage, to examine all information regarding that control each year, and to make recommendations for the better coördination of the work undertaken by the different administrations for this purpose under the terms of the International Sanitary Convention of 1926. Another forward move is the proposal to issue a comprehensive annual, giving data regarding quarantine administration in all countries. The committee of the Office has begun giving authoritative opinions on such administrative questions as the abolition of unnecessary consular visas on bills of health and deratisation certificates, the use of wireless telegraphy for quarantine purposes, the necessity of rat guards, and cognate matters. Air traffic, too, is raising new problems in the dissemination of disease, and the Office has decided to study the basis on which measures of sanitary defence should be insisted upon in the case of aircraft arriving from infected countries. The discussion at the session revealed the apprehension as to the spread of yellow fever in Africa which led to the Anglo-French Conference at Dakar in April, and a more recent agreement between the Belgian Congo and Angola for the application of special local measures in addition to those advocated by the International Sanitary Convention.

PRESENTATION TO PROF. PRIESTLEY SMITH.

A PLEASANT little ceremony took place at the Queen's Hospital, Birmingham, on Friday evening last week, when Prof. Priestley Smith was presented with his portrait in appreciation of his long association with the hospital. It was in 1867 that Joseph Priestley Smith first entered the Queen's Hospital as a medical student, after having been apprenticed, as befitted his prænomen, for four years at mechanical engineering. He thus came to his medical studies with a working knowledge of mechanics and familiar with the properties of materials, an equipment which provided the necessary background to his ophthalmological work and made it feasible for his ame to become attached to all manner of appliances used in the oculist's consulting-room. Seven years after taking his qualification Priestley Smith gained the Jacksonian prize for his essay on glaucoma, and his theory of the development of that mysterious and disastrous disease still holds the field. In 1898 he delivered the Bowman lecture of the Ophthalmological Society. In 1901 he was elected F.R.C.S., joining the small group of members of 20 years' standing who have been so honoured, and in 1904, when the Nettleship gold medal was to be awarded for the first time, it was Priestley Smith who was the recipient. Finally, the American Ophthalmological Society last year gave him the Lucien Howe medal in succession to Kohle and Fuchs, after sending over a representative to see for himself the apparatus used to investigate circulation in the eye. Sir Charles Hyde, President of the Queen's Hospital, who made the presentation, remarked on the bewildering nature of Priestley Smith's achievements, which read to him like a fairy story, and, he added, "like the fairies, he does not appear to grow older." Apart from his work on glaucoma and the growth of the crystalline lens, Priestley Smith will always be associated with the study of visual function by means of perimetry, and with the educative treatment of strabismus; a tape for measuring the angle of squint and various perimeters appear in every instrument maker's catalogue. The portrait has been painted by that well-known artist and technician, Mr. Harold Speed, and is considered excellent both as a likeness and as a picture; it includes some accessories suggestive of research work. In replying to the presentation Prof. Priestley Smith asked the chairman of the hospital to accept the portrait which is to be hung in the board room.

THE Royal College of Physicians of London will be closed from Saturday, Dec. 22nd, till Saturday, Dec. 29th, both days inclusive.

THE Medical Society of London has arranged a specially interesting programme for the second half of the present session. Beginning with a pathological evening on Jan. 14th, it continues on Jan. 28th with a discussion, introduced by Dr. E. I. Spriggs, on Starvation in Treatment. On Feb. 28th Prof. A. H. Burgess and Mr. C. H. S. Frankau will open a discussion on Acute Intestinal Obstruction, and on March 11th Dr. Reginald Miller and Dr. W. G. Wyllie will speak on the Chronic Dyspepsias of Children over the Age of Infancy. At a meeting on March 25th the subject will be the Medical Indications for the Induction of Abortion and Premature Labour, the openers being Mr. Eardley Holland, Dr. B. T. Parsons-Smith, and Dr. Bernard Hart, and the session will close with the annual meeting on May 13th, when Prof. Grey Turner will deliver the annual oration, taking Cancer of the Colon as his subject. The Society's Lettsomian lectures on Dermatology in Relation to other Branches of Medicine will be given by Dr. H. W. Barber on Feb. 18th and 27th, and March 6th, and the annual dinner will take place at the Trocadero Restaurant on Friday, March 8th.

The President of the French Republic has appointed Dr. David Thomas Barry, F.R.C.S., professor of physiology at University College, Cork, to be a Knight (Chevalier) of the Legion of Honour.

KING GEORGE V. HOSPITAL.—The Lord Mayor of London and the Chairman of the London County Council have issued a combined appeal for the erection of the proposed King George V. Hospital at Ilford, which is to serve the large new population of Becontree and the neighbourhood around Ilford. Some 200,000 persons are to be housed, mainly by the London County Council, and it is expected that eventually the population will approach half a million. At present the only hospital accommodation is the Ilford Emergency Hospital of 70 beds. Both the King and Queen have given subscriptions.

phenomenon. However, one phenomenon of asthma and the other so-called allergic diseases—e.g., hay-fever, paroxysmal rhinorrhœa, angioneurotic œdema, urticaria, and so forth—occurs which differs from that seen in experimental anaphylaxis. A preliminary sensitising injection of antigen is always necessary to produce experimental anaphylaxis, whereas in naturally occurring allergic diseases evidence of such a preliminary sensitisation is usually wanting. This is not always so, because it is possible that the antigen—of which only quite small doses are necessary—may get in through an abraided mucous membrane. For instance, during gastro-intestinal disturbances it is possible that some undigested product such as egg protein may be absorbed from the intestinal tract and so give rise to a permanent state of hypersensitiveness or anaphylaxis to this substance. However, in allergy there are no doubt other factors also present, and heredity or diathesis, nervous factors, and occasionally exposure to light or drugs undoubtedly play a part in addition to the protein irritation and the original trauma through which the protein gained access to the body.

A Clinic for Allergic Diseases.

Shortly after the war an out-patient clinic for allergic diseases was instituted at the Royal Victoria Hospital, Montreal; it is now a recognised part of the out-patient service of the hospital. Thirty or forty different substances are used in this clinic for testing purposes. They include common foodstuffs, animal emanations, or epidermal proteins and pollens. Both the last two groups cause attacks of asthma by being inhaled, and even foodstuffs occasionally produce their effect by inhalation, as in bakers and housewives exposed to the dust of wheat and other grain. Orris root, the rhizome of the iris lily, is a common constituent of scented and tinted face powders because of its agreeable odour and flesh tint and is a potent cause of asthma and paroxysmal rhinorrhœa, due to inhalation. House dust and van Leeuwen's atmospheric mould allergens are other possible causes. In Montreal the tests are carried out by putting on the skin of the forearm a drop of N/10 or N/20 solution of NaOH and dissolving in this a small quantity of the protein applied on the point of a small knife; a superficial cut one-eighth of an inch long is then made through the mixture. A positive result appears in 20–30 minutes, and consists of an urticarial wheal half a centimetre in diameter with a surrounding zone of erythema. Results even less pronounced than this are recorded since they may point to the ætiological factor. The control must, of course, be completely negative.

Out of 160 cases of asthma which do not include patients suffering from hay-fever, vasomotor rhinitis or skin diseases, 25 have been classified as asthmatic bronchitis. Here the chronic bronchitis is the primary disturbance, and has been present for some time. The condition is not really allergic at all. These patients are worse in winter. There is much breathlessness on exercise. They do not enjoy intervals free from bronchitis between the attacks. There is much cough, leading to severe dyspnœa, often described as choking fits, and the sputum is copious. Potassium iodide and stramonium are given with codeine if the cough is distressing; not infrequently a change of climate is necessary. The remaining 135 cases of the series were classified as true asthma, and only 16 per cent. of these were found to be negative on skin testing. The sensitive patients fell into two groups—those mainly sensitive to epidermal substances, and those mainly sensitive to food, but there is frequent overlapping between the groups in individual cases. In the epidermal group feathers were positive in 58 per cent., cat hair in 38 per cent., horse dander in 36 per cent., and dog hair in 26 per cent., and other epidermals such as sheep's wool, rabbit hair, and cattle hair in 18 per cent. Seldom did a patient react to but one of these animal emanations; usually a group relationship to be distinguished from true multiple sensitisation was found to exist. Of other inhaled proteins orris root reacted in 9 per cent. and pollen in 29 per cent.; of the foods, wheat reacted in 40 per cent., oats in 13 per cent., rice in 10 per cent., barley in 9 per cent., corn in 4 per cent., and rye in 3 per cent. In vegetables the following was the order of frequency: tomatoes 15 per cent., potatoes 12 per cent., celery 12 per cent., beans 10 per cent., peas 8 per cent. Of animal and fish foods, lactalbumin was found to lead to reaction in 12 and casein in 3 per cent.; egg-yolk in 4 and egg-white in 3 per cent.; pork in 3; beef and chicken each in 2 per cent.; while of fish proteins haddock, mackerel, and salmon each reacted in 4 per cent.

In examining patients at this clinic the personal history is especially directed to finding out how the different tissues of the body are affected during the attack; whether, for example, the symptoms are: (*a*) ocular—history of swelling, itching, or lacrymation; (*b*) nasal—sneezing, blockage of the nose, itching, profuse watery discharge, the so-called vasomotor rhinitis syndrome; (*c*) pharyngeal—itching of the soft palate, cough; (*d*) bronchial—tightness, wheezing, paroxysmal cough, and clear sputum; (*e*) cutaneous—manifestations such as urticaria, angioneurotic œdema, eczema, erythema, and pruritus; (*f*) gastro-intestinal—idiosyncrasies to certain foods, attacks of vomiting, pain, and diarrhœa, otherwise unexplained; (*g*) urinary; and (*h*) nervous. As has been emphasised frequently the family history in allergic disease is of the greatest importance. In the series discussed this was positive in but 32 per cent. of cases, but the figure is lower than it would have been had it been possible to make more careful inquiry. In the records of other observers roughly 50 per cent. of patients have given a positive family history. Treatment consists in keeping the patient away from those substances which produce the most marked skin reactions. In feather cases kapoc pillows are prescribed, though it must be remembered that kapoc, or some mould that it harbours, occasionally produces asthma. In epidermal cases, where association with animals is essential, vaccination is recommended.

Infective and Reflex Asthma.

In a group of cases classified as infective and reflex asthma usually no bronchitis is present between the attacks; but there is evidence that the asthma is due to infection in other parts of the body. The question remains open whether the asthma is due to sensitisation to the bacterial proteins or is merely due to reflex irritation. That such reflex asthma may be due to marked deviation of the septum, septal ridges or spurs, and marked turbinate hypertrophy is quite easy to understand. Brodie and Dixon proved definitely that the stimulation of the nasal mucous membrane produces a reflex bronchial constriction.

Thirteen cases of asthma were associated with antral infection, and in only two or three were proteins found definitely positive. In all these cases the symptoms occurred chiefly in the winter, in wet weather, and especially at night time on lying down, so that the asthma may have been due to irritation from the trickling of a nasal discharge down the pharynx.

Seven cases were associated with nasal polypi alone, two others with ethmoiditis in addition, and three with chronic ethmoiditis, making a total of 12 cases. Of eight cases in whom polypi were removed, the result was good in five, but in each of these there was a definite protein factor which was also attended to. In three patients negative to proteins, but suffering from bronchitis, there was no appreciable change.

Ten cases had such mechanical defects as marked septal deviation, septal ridges or spurs, and pronounced hypertrophy of turbinates, all tending to obstruct the airway and to favour infection. In all but two protein sensitisation was found. In only one was operation resorted to, and it was successful. Tonsils and adenoids do, in a small number of cases, play an important role, though the usual history is that these have been operated upon at least once without relief. However, after other avenues have been explored, operation may be called for.

In some patients asthma starts or is associated with "colds in the head": here no cause is demonstrable

a superficial drain. If the diagnosis of osteomyelitis is not confirmed, no harm can result from such a procedure in competent hands. Its more frequent application would mean the saving of many limbs and lives.

The Management of the Case.

The treatment of osteomyelitis is based on two aims: (1) to combat the systemic infection by suitable general and specific therapy; and (2) to establish adequate drainage of the infected area at the earliest moment.

1. *General Measures.*—It is unnecessary to describe the ordinary treatment of an acute infective illness. Of the results obtained from such methods as immuno-transfusion, intravenous antiseptic medication—e.g., glauramine or mercurochrome—reports are conflicting. But in desperate cases the potential value of such measures can hardly be ignored.

2. *Operative Measures.*—All drainage operations should be designed to avoid (*a*) further devascularisation of bone; and (*b*) the introduction of infection into non-infected areas. Three types of drainage operation are available.

(*a*) *Subperiosteal and Metaphyseal Drainage.*—At first the infected area consists of the original juxta-epiphyseal focus alone. A little later the subperiosteal collection of pus must be drained in addition. The metaphysis should be opened freely by multiple drill holes, or by the removal of a small trephine disc. All pus and debris should be sponged out lightly, but no curetting of the cancellous tissue should be practised. At this stage there is no justification for the common practice of extending the opening in the bone along the shaft, and exposing the medullary canal for a distance equivalent to the area of the subperiosteal stripping (the "gutter" operation).

(*b*) *Diaphyseal Drainage ("Gutter" Operation).*—At a later stage when the whole of the shaft is infected free drainage of the interior demands an adequate opening into the medullary cavity. The "gutter" operation, which is now unavoidable, is apt to imperil the viability of the remainder of the shaft, and in a subcutaneous bone has the further disadvantage of leaving an avascular adherent scar.

(*c*) *Primary Subperiosteal Resection of the Diaphysis.*—This operation, which has been advocated in the early stages of acute osteomyelitis, has not found favour with the majority of surgeons. The advantages claimed are (*a*) that it gives a most adequate drainage of the subperiosteal space; (*b*) that all infected bone likely to die at a later stage is removed in the beginning; and (*c*) prolonged suppuration and the need for secondary operations are avoided. Such advantages are mainly theoretical. The outstanding objection to subperiosteal resection is the risk of failure of regeneration and consequent interference with the growth of the limb. The procedure is irrational in the metaphyseal stage of the infection. but in a long bone riddled with osteomyelitis it may occasionally be considered as an alternative to the "gutter" operation in the subacute stage.

HARRY PLATT, M.D. Manch., M.S. Lond., F.R.C.S. Eng.,

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THE BIRMINGHAM HOSPITALS.—The scheme for the creation of a new hospital centre to be associated with Birmingham University has advanced a step further by the appointment last week of a secretary to the executive board. The appointment, the salary of which is £1500 a year, has been conferred upon Captain J. E. Stone, chief accountant of St. Thomas's Hospital, secretary of the Central Bureau of Hospital Information, and author of various books on hospital organisation and management. The new hospital, which is to contain 750 beds, is estimated to cost £750,000.—The Birmingham Hospitals Contributory Scheme now has 323,000 workpeople members employed by over 4215 firms in and around Birmingham. This is an increase of 66,000 in the first year. Of the 4215 firms, however, only 1458 have yet joined.

Special Articles.

ASTHMA AND RELATED DISEASES.

DR. A. T. HENDERSON'S REVIEW OF RECENT WORK.*

IN 1902 Charles Richet found that if a dog which had received a non-toxic dose of some poisonous protein was after a certain time given a second injection of the same protein, a violent and often fatal reaction followed. To this phenomenon was given the name of anaphylaxis. It is a curious feature of anaphylactic shock that its symptoms vary in different animals, though collapse to a greater or less degree and fall of body temperature always occur. In the guinea-pig, for example, violent respiratory efforts are made and the smooth muscles of the bronchioles are in extreme contraction. In the rabbit respirations are increased in a different way and death is due to right-sided heart failure, the result of increased resistance in the pulmonary circuit due to constriction of the pulmonary arterioles. In the dog the liver becomes greatly engorged. Dale and his co-workers drew attention to the great similarity between these reactions and those due to poisoning the animals by histamine; this suggested that the sudden breakdown of protein molecules is the factor directly responsible for anaphylactic shock, and it has now been definitely established that the cause is the interaction of antigen and antibodies in the tissue cells of the animal. The injection of antigen in the first place leads to the production of antibodies, which remain for a time in the circulating blood. In this early stage the animal is immune; further injections of antigen do it no harm since the antigen is taken up by the antibodies in the blood stream. But after 15–18 hours the antibodies leave the circulation and enter the tissues. In this later stage the animal is anaphylactic. This is proved by making an animal anaphylactic to horse serum, removing its uterus, washing it free from blood, and treating it with horse serum. A maximal contraction is obtained; but the uterus does not contract if other sera are used instead of horse serum. The reaction is thus specific. From what has been said it follows that though the animal shortly after an injection of antigen is not anaphylactic, its blood as soon as it contains antibodies is potentially anaphylactic; if this blood is injected into a second animal the latter becomes passively anaphylactic (or passively sensitised) 15–18 hours later, when the injected antibody reaches the tissue cells. Further, it has been found that the antibody disappears from the blood as the animal becomes passively anaphylactic. Active immunity is produced by treating an animal with successive doses of antigen at frequent short intervals so that the blood becomes crowded with antibodies. Such an animal will not suffer from anaphylactic shock if a fresh dose of antigen is administered because there are sufficient antibodies in the blood to neutralise the antigen, although it may be proved that the tissues themselves also contain antibodies. This method is used when a patient with hay-fever is treated with small but gradually increasing doses of pollen, so that when he is subjected to a large dose in the hay-fever season no attack follows.

There is another method of arresting anaphylaxis when it is once established. It is to give the animal a non-fatal anaphylactic shock which automatically gets rid of the antibodies from the tissues so that a refractory period of some duration follows before the antibodies again become stored there. This refractory state has been called anti-anaphylaxis.

The response of the guinea-pig to anaphylactic shock resembles so closely an attack of asthma in man as to suggest to anyone that asthma is an anaphylactic

* Being an abstract of the Harben Lectures delivered on Oct. 23rd, 26th, and 30th, 1928, before the Royal Institute of Public Health by Dr. Arthur T. Henderson, Lecturer in Medicine of McGill University, Montreal.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1927 statistics of eight metropolitan boroughs:—

Name of borough and estimated (R.-G.) population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases, with influenza.	Heart diseases.	Infant and neonatal mortality.	Diarrhœa, &c., under 2 years.	Maternal mortality from childbirth.
Kensington (176,700)	15·0	13·8	0·80	1·83	3·1	2·4	66/23	10·9	2·2
Paddington (142,700)	15·5	13·6	0·82	1·73	2·6	2·2	79/23	7·2	4·1
Lambeth (307,700)	16·2	12·6	1·07	1·66	2·5	1·7	55/22	5·8	4·2
Bermondsey (121,000)	18·5	12·9	1·45	1·35	3·0	1·6	67/—	5·4	4·0
Battersea (169,000)	16·6	12·2	1·03	1·49	2·3	2·4	53/28	2·5	2·1
Bethnal Green (117,900)	19·9	11·3	1·12	1·29	2·5	2·1	58/20	10·2	1·7
Westminster (136,300)	10·0	12·3	0·83	1·73	2·8	2·4	69/34	11·4	5·7
Holborn (42,269)	12·0	12·5	1·30	1·18	3·1	1·9	38/8	10·0	4·0

The young (1–5) child death-rates per 1000 births were: Kensington 32, Paddington 30, Lambeth 34, Bermondsey 42, Battersea 29, Bethnal Green 37, Westminster 23, Holborn 24.
— = No information.

Kensington.

Dr. James Fenton calls particular attention to the statistics with regard to tuberculosis. Since 1919, when the death-rate was 1·31, there has been a steady decline in the tuberculosis mortality to its 1927 rate of 0·80. Soon after the war the council assumed full control of tuberculosis work in the borough. Dr. A. W. K. Picard is the whole-time clinical tuberculosis officer. The borough is divided into seven areas with a woman health officer in charge of each, and it is estimated that the seven women health officers devote three-sixteenths of their time to tuberculosis work. The dispensary staff also includes two indoor nurses, a clerk, and a caretaker. At St. Mary Abbots Hospital there are 48 beds for emergency cases, some of whom are waiting for sanatorium treatment, for advanced cases with unsatisfactory home conditions, and for patients who cannot be adequately nursed at home. Dr. Picard acts as visiting medical officer to the hospital for these patients and arranges for their transfer as required to the L.C.C. Sanatoria. X ray diagnosis and light treatment is available and the consulting services of the staff of St. Mary Abbots. The tuberculosis dispensary is used fairly extensively as a consultation centre. Thus 231 cases were referred to the dispensary by private practitioners during 1927. Every effort is made to secure the examination of all contacts and there is a steady rise year by year in the number of contacts examined. Suspects are also keenly followed up. A dental officer is provided and home nursing is carried out by the Kensington District Nursing Association. There is an active care committee embracing representatives of all statutory and voluntary bodies likely to be interested, and one of its latest ventures is the provision of a handicrafts class for tuberculous patients.

Interesting details are given of the municipal scheme for the control of acute rheumatism. From Oct. 1st, 1927, acute rheumatism in children under 16 (defined as (a) rheumatic pains or arthritis if accompanied by a rise of temperature, (b) rheumatic chorea, and (c) rheumatic carditis) was made a notifiable disease for a period of three years. The rheumatism supervisory centre is established at the Princess Louise Hospital under the charge of Dr. R. C. Lightwood (assistant physician to the hospital), who becomes consulting physician to the borough of Kensington for acute rheumatism. Beds are provided for acute rheumatism both at St. Mary Abbots and the Princess Louise Hospital, under the charge of Dr. Lightwood. The council make an annual grant towards the provision of beds in suitable recovery homes. After notification the staff of the medical officer of health make full inquiries as to the conditions in the home and persuade the parents to take the child to the supervisory centre. A committee, including representatives of all the statutory and voluntary bodies likely to be interested, supervises the scheme and helps in the searching out of cases needing attention. "Long stay" cases for convalescent treatment may be dealt with by the M.A.B. hospitals or arranged for through voluntary channels. During the first three months of the operation of the scheme 48 cases were notified, the homes of which were investigated by the health visitors. The centre was opened in temporary premises on Oct. 29th and transferred to the new Princess Louise Hospital on Dec. 3rd. Up to the end of the year nine sessions had been held at which 26 new patients presented themselves. On May 21st, 1928, the Princess Louise Kensington Hospital for Children was opened by the King and Queen, and then consisted of an out-patient department and two ward units providing 36 beds, with accommodation for the staff.

Antenatal work makes good progress in Kensington. There are eight municipal clinics and in addition a special antenatal clinic at Queen Charlotte's Hospital Nurses' Home. It is considered that about 60 per cent. of the expectant working-class women in the borough now receive antenatal advice. The maternal mortality for 1927 was encouraging.

Paddington.

The report of Dr. G. E. Oates shows that the public health services have developed on somewhat different lines to those of its neighbour Kensington. Thus, there are two tuberculosis dispensaries, both of which are voluntary agencies subsidised by the council. The dispensary at St. Mary's Hospital serves the eastern portion and the Paddington Tuberculosis Dispensary (20, Talbot-road) serves the western portion of the borough. In addition to the subsidies the council pays for dental treatment by arrangement with the British Dental Hospital and for the cost of artificial pneumothorax at 10*s.* 6*d.* per refill. During 1927 four patients received the latter treatment at a cost of £24 13*s.* 6*d.* There is ample hospital accommodation for both mother and baby when needed for ophthalmia neonatorum. Out of 15 cases of ophthalmia notified in 1927, eight were treated as in-patients. Cases of puerperal fever are removed to one or other of the M.A.B. hospitals. Seven cases were notified in 1927 and all were nursed in hospital. In addition, 31 cases of puerperal pyrexia were notified, 26 of which received in-patient treatment. Mr. A. W. Bourne, F.R.C.S., has been appointed consultant for puerperal pyrexia but no request was made for his assistance during the year.

The maternity and child welfare centres are provided by the Paddington School for Mothers and carry out some antenatal work. During 1927 283 women from Paddington were admitted for confinement to Queen Charlotte's Hospital and most of these attended the antenatal department of the hospital.

Paddington was the first area in Great Britain to make acute rheumatism a notifiable disease (from March 1st, 1927). The regulations "enjoin the medical officer of health to make such inquiries and take such steps as are necessary or desirable for investigating the source of disease, for removing conditions harmful to the patient, and arranging for the treatment of the patient." "All these inquiries and any necessary

other than an apparent lack of resistance in the nasal mucous membrane. These patients are always worse in the winter months, or rather in the late autumn and early spring, when the weather is most capricious, and the changes sudden and disturbing. Lastly, a large group of patients, who are true asthmatics, have a superadded infection of the bronchial tubes. Twenty of these exhibited multiple sensitisation to a marked degree. Nearly all had had asthma for a long time. Usually, in this group, vaccines are of material benefit.

MEDICINE AND THE LAW.

Injury from Rat-bite.

Two years ago an infant about a week old was bitten by a rat in the Crayford Maternity and Nursing Home in Kent. An action in respect of the infant's injury was recently brought against the trustees of the home, the committee of management, and the nurse in charge of the baby at the time. On the third day of the trial it was apparently conceded that no action would lie against the trustees, but the rest of the claim was left to the jury, who disagreed and were discharged. The form of the action was a claim by the infant (through its father) for damages for personal injuries due to the defendants' negligence, a claim by the mother for damages for personal injuries to herself caused by shock, and a further claim by the father for special damage incurred by reason of the injuries to his wife and child. The actual facts about the rat-bite were not much disputed. The plaintiffs' case was that, in accordance with the usual practice at the home, the baby was taken from its mother at 9 P.M. and placed in a cot in the basement kitchen of which the floor was some 3 ft. below the ground level. At 1.30 in the morning the nurse on night duty heard a child cry, and, on going to the cot, saw a rat emerge and disappear through the window. The baby's face had been bitten. At 6 A.M. the mother was awakened and told that her baby had met with an accident; to save her feelings she was told the accident was caused by a cat. The mother said that, when she saw the baby's disfigured face, she received such a shock to her nerves that she was ill for a long time: she still suffered from bad dreams about rats. The father said that twice, when motoring, his wife had fainted at the sight of rats running across the road. The issue in the case was whether the rat-bite was a mere accident which, however regrettable, did not create any legal liability, or whether the defendants had been guilty of negligence. The actual allegation of negligence put forward by the plaintiffs was the failure to protect the child's cot in a place which was known to be infested with rats. There was, however, a good deal of evidence to the effect that no rats had ever been seen on the premises at any other time, and that there had never been any complaint of rats being present. The house was an old one, but the drains were in perfect order and there were no signs of rat-holes in the room. The sanitary inspector and rat officer for the local district council said he had examined the house and grounds and found no trace of rats there. The matron at the home explained that one reason why the babies were placed in this kitchen at night was that there was a good fire there and that prematurely born infants required heat and care all night, and it was impossible to have them in the wards with their mothers. She said no patient and no member of the domestic staff had ever mentioned rats to her. No meal was cooked in the kitchen after 12.30 P.M. and no food was kept there. It appeared from the evidence of another witness that, since this accident, the babies at the home are still placed in cots in the kitchen under charge of a nurse at night, but no longer in a basement kitchen. The jury, as already stated, was unable to agree upon a verdict either in favour of plaintiffs or defendants. This means that the plaintiffs are free to start their action all over again.

Parent's Neglect of Child.

Reference was made in these notes a few weeks ago to summary proceedings taken at the instance of the Wolverhampton Education Committee against a father under Section 12 of the Children Act for neglect of his child in refusing to allow an operation for the removal of tonsil obstruction. The father's contention was that he had not refused medical treatment, but he would not allow an operation which might have a fatal result. The magistrates were prepared to convict him, but adjourned the case to see what course he would take. He has now applied for a further adjournment to enable him to call medical evidence—presumably to show that the suggested operation is dangerous and that the child's health is either in no need of treatment or can be improved by some other method than an operation. The medical evidence for the prosecution at the original hearing was unanimous and unchallenged and was such as has hitherto been accepted in similar proceedings under Section 12. It will be interesting to see the result of the adjournment; the court originally adjourned, it was understood, to see whether the father would do voluntarily what the court had power to compel—not to enable him to reopen his defence.

Fumes from Electrical Power Station.

A farmer at Barton-on-Irwell brought an action at Manchester Assizes against the Manchester Corporation, praying for an injunction to restrain the corporation from so working their electricity station as to commit a nuisance by emitting fumes heavily charged with sulphur and sulphur compounds. The fumes, he said, were injurious both to the land which he occupied and to his own comfort and health. The corporation admitted the nuisance, but pleaded that the power station was one of a kind authorised by Parliament to be built at the place in question and that no means which science could suggest could have avoided the nuisance. Mr. Justice Talbot upheld the contention of the corporation and dismissed the plaintiff's action, but on appeal (by a majority of two judges to one) the Court of Appeal has reversed the decision. The case, which is of supreme importance to the undertakers of electrical power stations and to local residents, is likely to go to the House of Lords, though the Court of Appeal in granting the injunction has suspended its order for a year to enable the corporation to adopt measures to mitigate or end the annoyance of which the plaintiff complained. In delivering the majority judgment Lord Justice Scrutton said the corporation did not seem, in building its station which was to be worked on a larger scale than any in England, to have considered what would be the effect of discharging so great a volume of sulphur fumes upon the countryside. They had not since consulted any outside chemical or electrical expert to ascertain whether the nuisance could not be abated or terminated by a different construction of the works or chimneys or by restricting the work of the station. No similar damage was reported in any other case and the corporation had been unable to explain why its works alone had caused such a nuisance. The corporation might be able to prove that it was inevitable that a generating station must damage agricultural land by depositing sulphur thereon, but they had not established that fact, nor had they satisfied the court that all possible means had been taken to discover the cause and the remedy and to adopt reasonable precautions against causing a nuisance.

SUNDERLAND MENTAL HOSPITAL.—It is proposed to enlarge this hospital at a cost of £150,000. The existing buildings are intended to hold 300 patients but there are at present more than 70 beyond that number, and nearly 50 others have had to be sent elsewhere. It is suggested by the Board of Control that the new institution should also serve South Shields and Hartlepool, thus avoiding the necessity for providing separate hospitals for those places.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1927 statistics of eight metropolitan boroughs:—

Name of borough and estimated (R.G.) population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart diseases.	Infant and neonatal mortality.	Diarrhœa, &c., under 2 years.	Maternal mortality from childbirth.
Kensington (176,700)	15·0	13·8	0·80	1·83	3·1	2·4	66/23	10·0	2·2
Paddington (142,700)	15·5	13·6	0·82	1·73	2·6	2·2	79/23	7·2	4·1
Lambeth (307,700)	16·2	12·6	1·07	1·66	2·5	1·7	55/22	5·8	4·2
Bermondsey (121,000)	18·5	12·9	1·45	1·35	3·0	1·6	67/—	5·4	4·0
Battersea (169,000)	16·6	12·2	1·03	1·49	2·3	2·4	53/28	2·5	2·1
Bethnal Green (117,900)	19·9	11·3	1·12	1·29	2·5	2·1	58/20	10·2	1·7
Westminster (136,500)	10·0	12·3	0·83	1·73	2·8	2·4	69/34	11·4	5·7
Holborn (42,200)	12·0	12·5	1·30	1·18	3·1	1·9	38/8	10·0	4·0

The young (1–5) child death-rates per 1000 births were: Kensington 32, Paddington 30, Lambeth 34, Bermondsey 42, Battersea 29, Bethnal Green 37, Westminster 23, Holborn 24. — = No information.

Kensington.

Dr. James Fenton calls particular attention to the statistics with regard to tuberculosis. Since 1919, when the death-rate was 1·31, there has been a steady decline in the tuberculosis mortality to its 1927 rate of 0·80. Soon after the war the council assumed full control of tuberculosis work in the borough. Dr. A. W. K. Picard is the whole-time clinical tuberculosis officer. The borough is divided into seven areas with a woman health officer in charge of each, and it is estimated that the seven women health officers devote three-sixteenths of their time to tuberculosis work. The dispensary staff also includes two indoor nurses, a clerk, and a caretaker. At St. Mary Abbots Hospital there are 48 beds for emergency cases, some of whom are waiting for sanatorium treatment, for advanced cases with unsatisfactory home conditions, and for patients who cannot be adequately nursed at home. Dr. Picard acts as visiting medical officer to the hospital for these patients and arranges for their transfer as required to the L.C.C. Sanatoria. X ray diagnosis and light treatment is available and the consulting services of the staff of St. Mary Abbots. The tuberculosis dispensary is used fairly extensively as a consultation centre. Thus 231 cases were referred to the dispensary by private practitioners during 1927. Every effort is made to secure the examination of all contacts and there is a steady rise year by year in the number of contacts examined. Suspects are also keenly followed up. A dental officer is provided and home nursing is carried out by the Kensington District Nursing Association. There is an active care committee embracing representatives of all statutory and voluntary bodies likely to be interested, and one of its latest ventures is the provision of a handicrafts class for tuberculous patients.

Interesting details are given of the municipal scheme for the control of acute rheumatism. From Oct. 1st, 1927, acute rheumatism in children under 16 defined as (a) rheumatic pains or arthritis if accompanied by a rise of temperature, (b) rheumatic chorea, and (c) rheumatic carditis) was made a notifiable disease for a period of three years. The rheumatism supervisory centre is established at the Princess Louise Hospital under the charge of Dr. R. C. Lightwood (assistant physician to the hospital), who becomes consulting physician to the borough of Kensington for acute rheumatism. Beds are provided for acute rheumatism both at St. Mary Abbots and the Princess Louise Hospital, under the charge of Dr. Lightwood. The council make an annual grant towards the provision of beds in suitable recovery homes. After notification the staff of the medical officer of health make full inquiries as to the conditions in the home and persuade the parents to take the child to the supervisory centre. A committee, including representatives of all the statutory and voluntary bodies likely to be interested, supervises the scheme and helps in the searching out of cases needing attention. "Long stay" cases for convalescent treatment may be dealt with by the M.A.B. hospitals or arranged for through voluntary channels. During the first three months of the operation of the scheme 48 cases were notified, the homes of which were investigated by the health visitors. The centre was opened in temporary premises on Oct. 29th and transferred to the new Princess Louise Hospital on Dec. 3rd. Up to the end of the year nine sessions had been held at which 26 new patients presented themselves. On May 21st, 1928, the Princess Louise Kensington Hospital for Children was opened by the King and Queen, and then consisted of an out-patient department and two ward units providing 36 beds, with accommodation for the staff.

Antenatal work makes good progress in Kensington. There are eight municipal clinics and in addition a special antenatal clinic at Queen Charlotte's Hospital Nurses' Home. It is considered that about 60 per cent. of the expectant working-class women in the borough now receive antenatal advice. The maternal mortality for 1927 was encouraging.

Paddington.

The report of Dr. G. E. Oates shows that the public health services have developed on somewhat different lines to those of its neighbour Kensington. Thus, there are two tuberculosis dispensaries, both of which are voluntary agencies subsidised by the council. The dispensary at St. Mary's Hospital serves the eastern portion and the Paddington Tuberculosis Dispensary (20, Talbot-road) serves the western portion of the borough. In addition to the subsidies the council pays for dental treatment by arrangement with the British Dental Hospital and for the cost of artificial pneumothorax at 10*s.* 6*d.* per refill. During 1927 four patients received the latter treatment at a cost of £24 13*s.* 6*d.* There is ample hospital accommodation for both mother and baby when needed for ophthalmia neonatorum. Out of 15 cases of ophthalmia notified in 1927, eight were treated as in-patients. Cases of puerperal fever are removed to one or other of the M.A.B. hospitals. Seven cases were notified in 1927 and all were nursed in hospital. In addition, 34 cases of puerperal pyrexia were notified, 26 of which received in-patient treatment. Mr. A. W. Bourne, F.R.C.S., has been appointed consultant for puerperal pyrexia but no request was made for his assistance during the year.

The maternity and child welfare centres are provided by the Paddington School for Mothers and carry out some antenatal work. During 1927 283 women from Paddington were admitted for confinement to Queen Charlotte's Hospital and most of these attended the antenatal department of the hospital.

Paddington was the first area in Great Britain to make acute rheumatism a notifiable disease (from March 1st, 1927). The regulations "enjoin the medical officer of health to make such inquiries and take such steps as are necessary or desirable for investigating the source of disease, for removing conditions harmful to the patient, and arranging for the treatment of the patient." "All these inquiries and any necessary

other than an apparent lack of resistance in the nasal mucous membrane. These patients are always worse in the winter months, or rather in the late autumn and early spring, when the weather is most capricious, and the changes sudden and disturbing. Lastly, a large group of patients, who are true asthmatics, have a superadded infection of the bronchial tubes. Twenty of these exhibited multiple sensitisation to a marked degree. Nearly all had had asthma for a long time. Usually, in this group, vaccines are of material benefit.

MEDICINE AND THE LAW.

Injury from Rat-bite.

Two years ago an infant about a week old was bitten by a rat in the Crayford Maternity and Nursing Home in Kent. An action in respect of the infant's injury was recently brought against the trustees of the home, the committee of management, and the nurse in charge of the baby at the time. On the third day of the trial it was apparently conceded that no action would lie against the trustees, but the rest of the claim was left to the jury, who disagreed and were discharged. The form of the action was a claim by the infant (through its father) for damages for personal injuries due to the defendants' negligence, a claim by the mother for damages for personal injuries to herself caused by shock, and a further claim by the father for special damage incurred by reason of the injuries to his wife and child. The actual facts about the rat-bite were not much disputed. The plaintiffs' case was that, in accordance with the usual practice at the home, the baby was taken from its mother at 9 P.M. and placed in a cot in the basement kitchen of which the floor was some 3 ft. below the ground level. At 1.30 in the morning the nurse on night duty heard a child cry, and, on going to the cot, saw a rat emerge and disappear through the window. The baby's face had been bitten. At 6 A.M. the mother was awakened and told that her baby had met with an accident; to save her feelings she was told the accident was caused by a cat. The mother said that, when she saw the baby's disfigured face, she received such a shock to her nerves that she was ill for a long time; she still suffered from bad dreams about rats. The father said that twice, when motoring, his wife had fainted at the sight of rats running across the road. The issue in the case was whether the rat-bite was a mere accident which, however regrettable, did not create any legal liability, or whether the defendants had been guilty of negligence. The actual allegation of negligence put forward by the plaintiffs was the failure to protect the child's cot in a place which was known to be infested with rats. There was, however, a good deal of evidence to the effect that no rats had ever been seen on the premises at any other time, and that there had never been any complaint of rats being present. The house was an old one, but the drains were in perfect order and there were no signs of rat-holes in the room. The sanitary inspector and rat officer for the local district council said he had examined the house and grounds and found no trace of rats there. The matron at the home explained that one reason why the babies were placed in this kitchen at night was that there was a good fire there and that prematurely born infants required heat and care all night, and it was impossible to have them in the wards with their mothers. She said no patient and no member of the domestic staff had ever mentioned rats to her. No meal was cooked in the kitchen after 12.30 P.M. and no food was kept there. It appeared from the evidence of another witness that, since this accident, the babies at the home are still placed in cots in the kitchen under charge of a nurse at night, but no longer in a basement kitchen. The jury, as already stated, was unable to agree upon a verdict either in favour of plaintiffs or defendants. This means that the plaintiffs are free to start their action all over again.

Parent's Neglect of Child.

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Keith thinks it is impossible to dissociate the marked improvement in maternity and infant statistics from the progressive policy of the Council. The chief centre is a well-equipped building with provision for light treatment, dental treatment, and massage. There is a staff of ten health visitors and nine part-time women doctors. Dr. Ruth C. Townsend reports on the maternity clinic at which a special session for postnatal cases has just been provided. Dr. Helen M. M. Mackay conducts a special consultation clinic, of which artificial light treatment is a feature, and which receives its cases from all the other clinics. The joint tuberculosis dispensary for Hackney and Bethnal Green is at the City of London Hospital for Diseases of the Heart and Lungs. The tuberculosis officer, Dr. H. Tylford Howell, is not greatly impressed with the benefits of artificial sunlight. He would also like to see the L.C.C. provide more beds for advanced cases in lieu of the scheme for the removal of the children of such patients from their homes. It is difficult to get the consent of the parents to this "boarding out."

Westminster.

Dr. Andrew J. Shinnie describes housing as second to none in importance among the public health issues, and expresses the opinion that the proposed schemes of his council will go a very long way to solving the problems of overcrowding, illegally occupied separate basement dwellings, and other insanitary conditions associated with housing shortage. The block of buildings named "Admiral House" was expected to be occupied in the middle of the present year and to house 234 persons in 11 two-roomed, 25 three-roomed, and 5 four-roomed dwellings. Westminster have also arranged to accept 50 houses on the L.C.C. estate at Hammersmith. The city council nominated 70 tenants but 15 were refused by the L.C.C. on financial grounds and 15 withdrew their applications. At the end of the year 40 Westminster tenants were housed on this estate. House-to-house inspection is being pursued with great activity. Dr. Shinnie has a good deal to say in criticism of the amateur survey which was made of Victoria ward in May to which great publicity was given and which has entailed much inspection without corresponding benefit. The kata-thermometer has been used for testing the ventilation of workshops, and the results seem to indicate that further investigation will be needed before the principles suggested by Prof. Hill can be brought into practical application. Immunisation was begun towards the end of 1926, and at the end of 1927 270 children had been treated without any unpleasant reactions. It was noteworthy that 30 of the children brought up for voluntary immunisation against diphtheria had evaded compulsory vaccination.

Holborn.

Dr. C. W. Hutt considers that "antidiphtheria immunisation is worthy of an extensive trial." Since it was begun in Holborn 720 persons have been immunised, all except 12 under the age of 15. Retesting, although unpopular with parents, is found to be necessary as 68 out of 555 immunised were found to be still Schick-positive, and six confirmed cases of diphtheria occurred among children, who had received the routine three injections but had not been retested. The first of the six, aged 4 years 4 months, when first Schick-tested had a severe attack 13 months after the last injections; the second, aged 6 years 5 months, a very mild attack 13 months after; the third, aged 3 years 3 months, a mild attack 18 months after; the fourth, aged 6 years 8 months, a severe attack 22 days after; the fifth, aged 7 years, a mild attack two days after; and the sixth, aged 1 year 8 months, a mild attack four years after. The fourth and fifth cases, of course, occurred before the lapse of the period required to secure immunisation. The reaction after the injections was in practically every case negligible. In order to facilitate antenatal care among the borough council has, with the approval of the Ministry, adopted from Jan. 1st, 1928, voluntary notification of pregnancy by medical practitioners and midwives for which fees of 2*s.* 6*d.* in private practice and 1*s.* in public practice will be paid. The notifications will only be made with the approval of the expectant mothers.

REPORTS OF SCHOOL MEDICAL OFFICERS.

—	No. on roll.	Percentage of aver. elem. school attendance.	No. of routine children examined.	No. of special examinations and re-inspections.	Percentage of children found on routine examination requiring treatment.*
Leicestershire	36,812	88·2	10,258	6,948	14·4
County of Warwick	—†	—†	11,508	9,028	13·7
Northumberland	—†	—†	15,546	8,294	23·81
Colchester ..	5,822	87·9	1,669	2,955	21·0
Glasgow ..	190,613‡	87·9§	46,611	44,854	49·7

* Excluding dental defects and uncleanliness. —† Not stated ‡ All types of school. § Ordinary school only.

Leicestershire.

LEICESTERSHIRE is now among the progressive authorities establishing orthopædic schemes. Dr. J. S. Fairer reports that a very substantial advance is being made by the provision of beds in Mansfield Orthopædic Hospital. For children living in the northern area of the county facilities are available at St. Gerards' Hospital, Coleshill; patients are selected at the clinics of the Loughborough Cripples' Guild by Mr. S. A. Malkin, who is surgeon both to the hospital and to the Guild. Children from the southern part of the county are referred to the orthopædic clinic at the Leicester Royal Infirmary, where they are selected for in-patient treatment by Mr. R. S. Lawson. For areas inaccessible to these larger centres it is proposed to establish clinics under the school authority for the provision of massage and electrical treatment; such a clinic is now being started at Coalville. It is recognised that local clinics will make for economy since by their use good results can be obtained with a shorter stay in hospital. The necessity of these facilities was made particularly obvious by the epidemic of anterior poliomyelitis of 1926, the effects of which were brought out in a special survey made in 1927 of the physically defective school-children in the county. Three beds are reserved for infants under the care of the maternity and child welfare committee in the Mansfield Hospital. The coördination of the infant welfare work with school and other branches of public health is made easy by the fact that the county medical officer is ultimately responsible for them all and by the fact that the senior medical officer for welfare work is also the clinical tuberculosis officer, while the other two medical officers are also school doctors. The transfer of relevant information between various departments is thus easy. Dr. Mary Weston has conducted an inquiry on the origin of infantile defects in school entrants and especially on the influence of measles and whooping-cough: the outcome was that the percentage of defectives (36 per cent.) was not materially affected by either or both these diseases. An analysis of the figures for special defects did not substantially modify these results, which are rather unexpected. The figures on which they are based are admittedly small (1000 children), but the inquiry was evidently conducted on sound lines. It may be that wider general knowledge and more efficient treatment during the course of these illnesses has resulted in a diminution of serious sequelæ.

County of Warwick.

The county of Warwick includes some large urban districts, so that the medical staff has to deal with

action," says Dr. Oates, "have been delegated to the Rheumatism Supervisory Centre which was opened at Paddington Green Children's Hospital on Oct. 9th, 1926." "The Centre is under the personal supervision of one of the honorary physicians to the hospital and there is also a salaried medical officer, who devotes her whole time to visiting cases of the disease and making such inquiries as may elucidate the causes thereof." There were 38 notifications received during the year and 27 of these children attended the supervisory centre.

Commenting on the high infant mortality, Dr. Oates suggests that Paddington is too much built over and too overcrowded, and that many families who are not badly off have to share with other families dwelling-houses which were only built for one family. There is a lack of garden and yard space. There are no slums in the ordinary sense and the number of houses, which require closing and demolition, is small. It is difficult to find any area in the borough suitable for housing development, and no municipal houses were erected during the year. The 1924 arrangement with the L.C.C., by which Paddington is allocated 15 houses per 1000 of those built by the County Council, still holds, but the estates mainly available, Becontree and Downham, are too far away. The waiting list of tenants is well over 1000.

Lambeth.

Dr. Joseph Priestley presents his farewell report after 32 years' service. He did not live long to enjoy the leisure of retirement, as will be seen from the obituary notice on another page. In June, 1895, Dr. Priestley was appointed medical officer of health to the old parish of St. Mary's, Lambeth, which became the borough of Lambeth in 1901. The report takes the opportunity of reviewing the many changes which have taken place in the public health service during that period and contrasts the death-rates of 1895, 1901, and of recent years. Among institutions he specially mentions the Council's new maternity home at Knight's Hill, which had a fine record for 1927 and will shortly need extension to cope with the requirements of the borough. A new assessment committee has been appointed to deal with the fees to be paid by the mothers. The report gives Dr. Priestley's opinion alone as to further needs and does not commit his successor (Dr. A. G. G. Thompson) who took over the duties on Nov. 1st, 1927. Two of these needs given by Dr. Priestley are the appointment of a woman medical officer for the detailed work of maternity and child welfare and the provision of an up-to-date central tuberculosis dispensary. At the present time there is an entirely inadequate central dispensary in Brixton with a branch dispensary at St. Thomas's Hospital, and the proposal has been put forward that the needs of the borough might be met by the establishment of a second dispensary at King's College Hospital. This would, in Dr. Priestley's opinion, be a great mistake and amount to a delegation of the whole of the council's tuberculosis work to outside organisations. An important advance made during the year was the new appointment of an experienced bacteriologist, Miss F. M. Speakman, to carry out the work in the municipal laboratory.

Bermondsey.

Dr. R. King Brown, in his valedictory report after 28 years' service, gives an interesting account of the development of the local public health services. Among post-war schemes he mentions the establishment in 1920 of a municipal dental surgery, under the direction of a (whole-time) surgeon, Mr. Grantley Smith. During 1927 a branch was opened in charge of a part-time dental surgeon. The new cases treated during 1927 exceeded 3000 and included pre-school children, children of school age, expectant and nursing mothers, and tuberculosis cases. Since July, 1924, as the result of a lecture at Guy's Hospital by Dr. Rollier, Bermondsey Council has reserved six beds at Leysin for the "long-stay" treatment of advanced non-pulmonary tuberculosis. During that time 14 patients have been sent and Dr. D. M. Connan, the tuberculosis officer (who has now succeeded Dr. King Brown), reports favourably as to the permanency of the cures effected at Leysin. Dr. Connan's report on the work of the specially built solarium, which is equipped for giving outdoor light treatment, shows that 456 new patients were treated. The rickets and malnutrition children under 5 did well when they attended regularly. The health of some ten antenatal cases was greatly improved. The value of light treatment for surgical tuberculosis, if given cautiously over a considerable period, was indubitable, but no definite pronouncement was possible as to pulmonary tuberculosis.

Details are given of the census taken during the year to obtain reliable data as to overcrowding. There are in the borough 29,284 families. Of these, 19,887 lived under conditions which give one person or less to a room; 6634 had two persons to a room; and 2763 families lived under conditions which give three persons or more to a room. One area of four acres has been cleared by the borough council, one of six acres is being cleared by the County Council, and the clearance of another area is in contemplation. Much of the work of the Bermondsey residents is of a casual nature and connected with the waterside. Such workers must be housed near their work. Dr. Brown urges that, in letting municipal houses, more care should be taken to see that the accommodation is exactly suited to the needs of the family, so as to avoid waste of rooms on the one hand and the evils of overcrowding and subletting on the other.

Battersea.

Dr. G. Quin Lennane reports that the development of antenatal work during the past four or five years has no doubt contributed to the satisfactory improvement in the maternal and infant mortalities and that the increased attendances at the central clinic at the borough maternity hospital will shortly render it necessary to increase the accommodation by the erection of an out-patient block. Miss Alice Bloomfield, F.R.C.S., who conducts four antenatal sessions weekly, shows that 1140 patients attended, being an increase of 68 over the previous year. The maternity hospital has 30 beds and admitted 602 cases. The appointment of a resident medical officer, who has also assisted at the antenatal clinics, has been a great advantage in securing continuity of treatment. At one of the clinics 674 women were tested by the Wassermann reaction, of whom 12 reacted. Of the babies born to the latter, six had a negative Wassermann, four appeared to be healthy but did not come up for testing, and two had a positive Wassermann, probably owing to the fact that they came under treatment too late. Half of them came after the seventh month. Dr. Lennane reports that "serious and even dangerous overcrowding" exists in the lower wards of the borough, and hopes that steps will be taken to speed up the provision of dwellings at rentals within the reach of those whose need is greatest. In October a clinic was established at one of the centres for the immunisation of children against diphtheria, under the charge of Dr. Mabel Brodie, and 52 children were being immunised at the close of the year.

Bethnal Green.

Dr. F. Leonard Keith, who took over the duties on May 2nd, in his first annual report picks out housing as the most serious single factor adverse to the public health. In 1919 13 unhealthy areas were scheduled by his predecessor, Dr. Oates. Only two of these areas have been attacked as yet, one by the borough and the other by the County Council. The borough council has fully exercised its powers considering its limitations. Procedure with respect to individual houses is precluded by common sense and humanity in the absence of alternative accommodation, and the housing problem is complicated by the prevalence of unemployment and low wages. Dr.

in the building which was formerly the Hillsfoot Training School of the Delinquency Board, and next year a similar school for boys will be provided. The children in this group are in practice divided into: (*a*) those requiring an extended period of residence outside the city with special medical attention; and (*b*) those who require a shorter period under good conditions but without special medical attention. There is now accommodation for both types, the Hillsfoot School receiving 70 Protestant girls of type (*b*).

The balance of treatment and inspection has been disturbed by the industrial dispute which, by affecting the financial position of many families, caused an increased demand for treatment and consequently a restriction of the time available for medical inspection, so that the number of routine inspections was lower than last year. The number of cases of ear diseases shows a rise of over 20 per cent. The attendances for treatment in general show small increases, but that for ionisation is much higher, indicating the value which is now placed on this treatment. Eye diseases show an increase of 37 per cent., especially in conjunctivitis due to decided epidemics in May and the early summer and in autumn. Affections of the skin in general account for nearly 14,000 cases as against 12,300 last year; impetigo accounts for 1000 of the increase, while scabies has had an increased prevalence for the first time since 1920. Dr. Roberts says that in previous years there has been a tendency for the actual diseases of the skin to decrease and for injuries, abscesses, and burns to increase. This year the accident type of case is six times as common as it was in 1920, but the usual fall in diseases of the skin has been prevented by the industrial conditions. Ringworm, however, has yielded to the influence of the special skin school and X ray treatment to such an extent that the special school has been closed. Necessitous cases of illness, for whom emulsion and drugs were given free, have been nearly 30 per cent. more numerous than last year. Many more teeth were treated this year. In this matter the greater enlightenment of the parents might be held responsible, but it is noteworthy that increase is in extractions and not in fillings.

MENTAL HOSPITAL REPORTS.

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THE number of fresh cases of tuberculosis coming to the knowledge of the health authorities during 1927, whether by formal notification under the Tuberculosis Regulations or from other sources, was 77,890. Notification is, on the whole, more effectively carried out year by year, but the reports of medical officers of health show that many deaths from tuberculosis have occurred amongst cases not previously notified. The number of deaths registered from all forms of tuberculosis in England and Wales for 1927 was 38,173. In England, on April 1st, 1928, tuberculosis work was being carried out in 440 dispensaries, and, in addition, 95 other premises were approved for special forms of treatment, including orthopædic out-patient care of tuberculous cripples after return from residential treatment. There were 378 approved tuberculosis officers. The number of beds allocated to tuberculosis in institutions, excluding 108 institutions concerning which no information is available, is 22,618. The number of patients occupying these beds varies: a certain proportion is always unoccupied particularly in the winter months. On April 1st, 1928, there were 19,710 patients, including 6128 children in the 22,618 beds.

In surveying the question as to how the tuberculosis scheme is working throughout the country, Sir George Newman passes under review problems of notification, diagnosis, bacteriological examinations of sputum, the use of X rays, home visitation, and length of sanatorium treatment. The figures given relating to residential treatment should be studied closely by those anxious to use the available bed accommodation to its utmost. The Ministry suggested in Circular 280 the advisability of differentiating patients into the early, intermediate, and advanced stages. They proposed that early cases or others in which there is hope of definite arrest of disease should be retained for long periods, also advanced cases admitted to institutions because they were dangerously infective; but that the needs of the intermediate class would usually be met by short periods of treatment, repeated when necessary. Yet in some areas a considerable proportion of the intermediate cases were retained in sanatoria for prolonged periods—over six months. The intermittent character of the disease makes it fairly certain that many patients in this class will relapse in any case. It

secondary schools and the continuation school at Rugby. The area is likely to undergo further changes, for by the Act that came into force on April 1st, 2550 school-children were transferred from the authority of the county to that of the extended city of Coventry. The change will mean some adjustment of the nursing staff and two of the clinics for minor ailments will no longer be required. The curtailment of the area may be of advantage, since the present strength of the health visiting staff is only barely sufficient for the ordinary routine work. As a result of an endeavour to economise on the expenditure on operations for tonsils and adenoids, an appeal was made to the medical inspectors to lower their standards and so reduce the number of cases referred for treatment. Accordingly, only 3·9 per cent. of all children have been referred for operation as compared with 6·7 per cent. last year. Such a marked decrease seems scarcely sound; it is not justifiable to allow children to suffer from all the physical and mental handicaps and the economic depreciation caused by obstructions of the nasal passages for a small saving in expenditure. But in many parts of the country there seems to be a tendency to be more conservative in recommending operative treatment, and the decrease may be due to causes other than the desire to economise. Considerable progress has been made in the development of the orthopædic scheme and most of the county is now covered, but it is held up at Stratford-on-Avon and in the Tamworth district until sufficient funds are forthcoming from the county council. Dr. Hamilton Wood includes in his report a valuable account written by Mr. R. P. Marsh of his work of organising physical education in all its branches. This account appropriately follows the section on orthopædics, for in this county there is a real unity of all the work designed to promote the right development of the child, from orthopædic surgery, remedial and physical exercises, to activities like swimming and organised games.

Northumberland.

Arrangements for the care of children in the counties with scattered populations are often less advanced than those in urban districts. Northumberland has still no orthopædic scheme, efforts to promote one having been frustrated by inability to secure hospital accommodation. One step, however, has been taken in the appointment of an orthopædic surgeon, Mr. William Mackenzie, and it is hoped that before long some workable plan may be presented. The scheme for the operative treatment of tonsils and adenoids is likely to be considerably extended in the near future. Dr. W. Whitley notes that the incidence of tonsils and adenoids appears to have fallen by 50 per cent. since 1920, and he thinks the fall may be partly due to change of standard; if that be so it is the more important that all those who are recommended for treatment should obtain it. The proposal to appoint a second dentist was not carried out for lack of suitable premises. It is now suggested that a dental van would be of value and would carry treatment into otherwise inaccessible places. Reports from other counties similarly placed, such as Cumberland where this device has been tried, show that it has proved very useful. The dental surgeon, Miss C. M. Anderson, deplores the prevalence of dental caries in infants; there is a general lack of oral hygiene and the children are neither trained nor interested in care of the mouth and teeth. That ignorance rather than apathy is the obstacle is shown by the fact that children who have been previously treated and inspected usually maintain better oral hygiene than the rest. Miss M. Wardle, organiser of physical training, writes of the importance of good posture and its important bearing on good health and hygiene. There are no special schools belonging to the local authority in Northumberland, and many defective children of all kinds still attend elementary schools or receive no education of any kind.

Colchester.

The report of Dr. W. F. Corfield shows that steady progress is being made. The actual number of routine inspections has fallen by 200; this is partly due to the decrease in the number of children reaching the age for medical inspection (which is more or less general over the country), and partly to an accidental local factor, the reduction in the number of children in two schools owing to an outbreak of measles and also to the illness of a school nurse. Of the orthopædic clinic Dr. Corfield says that the good work done has been far greater than he expected, and that every year a larger number of children who would have grown up with a deformity such as a club-foot are now discovered in time, and if they are not completely cured the deformity is so modified and moulded that a limb which would have been unsightly and almost useless is made strong and useful. The orthopædic surgeon, Mr. Whitchurch Howell, sees also infants referred from the infant welfare department, and it is hoped that next year he will have the assistance of a nurse trained to give remedial exercises. A testimonial to the work done in Colchester is the large and increasing percentage of parents attending medical inspections; in 1925 it was 77, in 1926 79, and this year 80 per cent., while for the entrants it was 93 per cent. These figures show that the interest and sympathy of the parents are being won. There is need for a full-time dental surgeon and a nurse to help him. The number of children actually treated is still scarcely more than a third of those who were found to need treatment, but a good sign is the fact that the fillings were 105 more than last year. In one small matter we cannot agree with Dr. Corfield. He suggests the possibility that the 50 per cent. fall in cases of defective vision may be due to improved school hygiene; but it is only myopia that is likely to be affected by school conditions, and the myopic children are less than a quarter of the total number suffering from defective vision. However this may be, Colchester may be justly proud of possessing a special class for sight-saving. There is accommodation for 22 children in special schools, and if there was an open-air school the return of exceptional children would be highly creditable.

Glasgow.

The report of Dr. E. T. Roberts is printed as an appendix to that of the Director of Education, and although many interesting facts are included they are set forth chiefly in the form of statistics. The effect of a large immigrant population is seen in the frequent mention of special and industrial schools for Roman Catholics, and it is probably the poor standard of living aggravated by the recent industrial conditions which causes the figures for heights and weights to be considerably below the standard of the anthropometric committee. The educable abnormal children can be dealt with under two great heads: (1) those fit for the special day schools for physically and mentally defectives; (2) those who require change of air with or without special medical attention.

(1) The special day schools and the "annexes" which serve a similar purpose are often arranged for the reception of both mentally and physically defective children—a system not very common in England. The total number of children on attendance in these special schools was 4984. The authority also gives attention to those mentally defective children who have reached 16 years or have been given exemption from school before reaching that age. Three women officers devote their time to keeping in touch with them and, if possible, finding them employment. The accommodation in institutions for those found incapable of receiving benefit from instruction given in special schools is, unfortunately, far too small. The matter is receiving the attention of the authorities concerned.

(2) There is increased accommodation in holiday schools; a new one for girls was set up last year

sidered by the tuberculin committee of the Council, who have advised that no useful purpose would be served by meeting these requests.

A useful recapitulation of our present knowledge of immunisation by Prof. Calmette's method of prophylactic vaccination of the new-born is included.

Prof. Major Greenwood, F.R.S., on behalf of the Medical Research Council Committee, has examined Dr. Biraud's report on 1537 infants brought up in a tuberculous environment, who had been vaccinated during the years 1924 to 1926. Of these 1050 had been in contact with tuberculous people and 487 in contact with tuberculous mothers. The general mortality from all causes in the two groups during the first year of life was 7·6 per cent. and 6·6 per cent., while the mortality from tuberculosis during the first year of life was 1·55 per cent. and 2·46 per cent. According to Calmette, a comparison of the mortality of vaccinated and unvaccinated children in contact with tuberculous mothers brought out striking results; the rate for the former was 6·6 per cent., and that for the latter 24 per cent. Prof. Greenwood considers that the mortality in the first year of life of the vaccinated children is no worse than that of ordinary children. Hence, if it could be shown that the rate of mortality of children of the class living in tuberculous homes is very much worse than the average, a prima facie case in favour of the process would have been made out.

It is clear that much more detailed information is necessary, especially of the mortality rates of vaccinated children brought up in contact with tuberculous mothers, before Calmette's claims can be completely accepted.

The provision of X ray facilities for purposes of diagnosis and to check the progress of a pneumothorax is commended. With the present facilities for the artificial light treatment of lupus there should be no need, in Sir George Newman's view, for utilising X rays in the treatment of this disease; the last-named practice involves serious risk of the appearance of carcinoma in the treated area.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED DEC. 8TH, 1928.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 155 (last week 189); scarlet fever, 2864; diphtheria, 1360; enteric fever, 39; pneumonia, 1133; puerperal fever, 46; puerperal pyrexia, 117; cerebro-spinal fever, 12; acute poliomyelitis, 9; encephalitis lethargica, 19; dysentery, 18; ophthalmia neonatorum, 97. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board[1] on Dec. 11th-12th was as follows:—Small-pox, under treatment 14; scarlet fever, 2488; diphtheria, 2129; enteric fever, 16; measles, 53; whooping-cough, 390; puerperal fever, 18 (plus 7 babies); encephalitis lethargica, 74; poliomyelitis, 4; "other diseases," 14. At St. Margaret's Hospital there were 6 babies (plus 2 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 3 (1) from enteric fever, 18 (0) from measles, 8 (2) from scarlet fever, 30 (6) from whooping-cough, 30 (8) from diphtheria, 51 (7) from diarrhœa and enteritis under two years, and 60 (10) from influenza. The figures in parentheses are those for London itself.

The fatal cases of enteric fever outside London were reported from Bristol and Manchester. Liverpool reported 3 deaths from measles, and Manchester 3 from whooping-cough. The largest number of fatal cases of diarrhœa were reported from Birmingham 8, Manchester 6, Liverpool and Salford 4 each (Glasgow 5, Belfast 8). No town reported more than 2 deaths from influenza except Birmingham 5, Leicester and Rochdale 3 each (Glasgow 7).

The number of stillbirths registered during the week in the great towns was 287 (corresponding to a rate of 11 per thousand births), including 51 in London.

[1] It is to be noted that seven cases of cancer of the uterus were in the North-Western Hospital.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Report of the Registrar-General of the Irish Free State.

THE Registrar-General's report for 1927 shows that the number of deaths registered in that year was greater than in the previous, whilst marriages and births were less. The excess of births over deaths was more than balanced by the net emigration. The death-rate was 14·77 per 1000 of the estimated population, which is lower than the average rate for the previous ten years (15·39), but higher than the rate for 1926 (14·05). The increase in the number of deaths was chiefly due to influenza, heart diseases, and respiratory diseases. The principal epidemic diseases continued to decrease. The number of deaths from tuberculosis was the lowest recorded, the rate being 1·45 per 1000 of the population. The corresponding rate in Northern Ireland was 1·41, in England and Wales 0·97, and in Scotland 1·0. The deaths from cancer continued to increase, the total number, 3113, being the highest recorded. The increase of 92 over 1926 occurred entirely among males. The increase in cancer has not been continued from year to year, but successive rises suggest that the disease is advancing. Heart diseases were responsible for 5031 deaths, almost equally distributed between the sexes—2439 of males and 2592 of females. The number of deaths under this heading was 375 above that for 1926 and 275 above the average for the ten years 1917–26. The death of infants under one year of age showed a mortality-rate over the whole country of 71 per 1000 births, as compared with 74 per 1000 in 1926. In Northern Ireland the rate was 78, in England and Wales 70, and in Scotland 89. The low rate in the Irish Free State is due to the very low mortality (56 per 1000) in rural areas. In urban areas the rate was 99, and in the city of Dublin 123. The rate among illegitimate children is, however, startlingly high—288 per 1000—or more than four times the mortality among legitimate children.

The births registered during the year represented a rate of 20·31 per 1000 of the population, being 0·05 below the average for the previous ten years. The birth-rate in Northern Ireland was 21·3, in England and Wales 16·6, and in Scotland 19·8. Marriages gave a rate of 4·54 per 1000 of the population, a rate 0·03 below that for 1926 and 0·44 below the average for the ten years 1917–26. The number of emigrants in 1927 was 27,309, and the number of immigrants 2084, resulting in a net loss of 25,225. Of the 27,309 who left the country 23,947 went to the United States of America.

Celebrations at Trinity College, Dublin.

Dublin University was engaged last week in celebrating the bicentenary of the birth of two of her greatest sons—Oliver Goldsmith and Edmund Burke. Mr. Stephen Gwynn delivered an oration on Goldsmith and Lord Birkenhead one on Burke. Mr. Gwynn's address concerned itself mainly with the personal life of his subject, with a brief estimation of his position in literature. He did not pay special attention to the medical side of Goldsmith's career. The most interesting part of the celebration—and perhaps that which honoured most the spirit of both Burke and Goldsmith—was an admirable inter-university debate in which young men from the Universities of Oxford, Cambridge, Edinburgh, and Paris, and from University College, Dublin, took part with young men of Trinity College, Dublin. The subject was: That a Censorship of Literature is Desirable. The motion was defeated by a large majority.

DONCASTER INFIRMARY.—By weekly deductions of twopence from their wages miners in the Doncaster district this year have contributed £6700 to Doncaster Infirmary. In six years the total has reached £42,700.

appears to be a sounder policy to give an intermediate case the shortest period of treatment which will restore his working capacity, and to readmit him for further short periods when relapses occur or appear to be imminent. On the other hand, the figures in column 36 are disappointing in the other direction, as indicating that many cases, presumably of the class in which complete arrest is possible, have been retained in residential institutions for *quite inadequate periods.* For the country as a whole only 22·5 per cent. of these cases stayed over six months. Local authorities and the general public should clearly understand that tuberculosis cannot be arrested by the sanatorium method unless that method is given a proper chance. Unfortunately, the period of stay is not the only factor which has mitigated against recovery. Sir George Newman concludes that—

(1) The *principle* of the sanatorium method is sound, and there is at present no alternative principle available.

(2) The sanatorium *system*, that is to say, the method or organisation by which the principle is practised, may be, *and often is, faulty. It is always in need of vigilant supervision* if it is to deliver the results desired.

(3) The critical issue must always be the *effective intensive treatment of each patient*, on his merits or demerits of physiology, pathology, and psychology. There can be no adoption of a "rule of thumb" practice.

He adds it is difficult to escape the conclusion that the superintendent is not always giving sufficient attention to the method and organisation of his sanatorium or sufficient intensive study to each individual case in his charge.

The Results of Sanatorium Treatment.

Unless a satisfactory proportion of the pulmonary cases classed as early can be classified as "quiescent" on discharge from residential treatment, the questions may well be asked :—

(*a*) Is such failure due to the type of the institution and the character of the treatment given thereat?

(*b*) Is it due to the fact that the duration of the patient's stay has been too short?

(*c*) In the case of the Class T.B. *minus*, is it due to the fact that intermediate and advanced cases have been wrongly included (through failure to have the sputum examined) in a group which should consist of early cases?

On the answer to these questions and the action taken thereon will depend very largely the future success of any sanatorium scheme, and the retention of public confidence in the value of sanatorium treatment. A few weeks ago a public statement was made by a representative medical man in regard to sanatorium treatment in England. He is reported to have said :—

"However useful sanatoria may be from a preventive point of view or as a means of segregating tubercular people, they are from a curative point of view I am afraid of little, if any, use. . . . In fact, the sanatorium method can only show 14 per cent. of cures, which is very low, whereas other methods can show 70 per cent. and 80 per cent. of cures."

This declaration was founded, according to information received, on the results obtained at one particular sanatorium in this country and upon an alternative method of treatment. If the statement be accurate, it is obvious that the State should direct its available resources not towards sanatorium treatment but towards some alternative method.

It is far from an easy matter to assess precisely the value of sanatorium treatment as indicated by the percentage of "cures" obtained. Certain other methods of estimating its value, however, are available. Substantial data exist for our general guidance, and these may be illustrated in three groups of facts.

In the first place, we may take into consideration the broad fact that from 1913 to 1926 there were in England and Wales *1,191,910 persons notified as suffering from tuberculosis* (including those certified as having died between 1913 and 1926 inclusive). During that same period, 1913–1926, the total number of deaths certified as due to this disease was 656,049. This leaves 535,861 tuberculosis patients as not *having died from tuberculosis* within that period, which gives us a survival rate of approximately 50 per cent., even though many of the known cases which died never received treatment under any public scheme.

Obviously this does no more than present a general picture of "recoverability," with or without sanatorium treatment or any treatment. From 1847 to 1926 the mortality from tuberculosis of the respiratory system in this country declined from 3189 per million to 730 per million, an astounding fall, and, moreover, recovery from small degrees of tuberculous infection is a matter of daily experience. In fact, under favourable conditions and in its early stages tuberculosis shows probably a higher degree of recoverability than any other of the great constitutional diseases. In the second place, while it is true that some sanatoria, indifferently conducted or unfavourably placed as regards the severity of the cases admitted, yield a small proportion of recoveries—i.e., cases classified on discharge as "quiescent"—it is equally true that a properly organised sanatorium system shows good results. For example, in Lancashire in 1926 over 80 per cent. of early cases were quiescent or improved on discharge.

After-care.

The importance of "after-care" in enabling patients to obtain the full advantage of treatment in residential institutions and in helping them subsequently to obtain suitable conditions of living and occupation is emphasised. Unfortunately there are many areas where no arrangements for care work have yet been made. One of the greatest difficulties in connexion with this work is that in some areas care committee workers do not realise how much efficient work can be done by advice and personal assistance in individual cases at trivial cost, and think that no useful work can be carried out unless ample funds are at their disposal. It is not suggested that many care committees do not require funds to enable them to carry out their work to the greatest advantage; but it is certain that much useful work can be carried out in the absence of such funds. The patient may need advice with respect to pensions, sickness benefit, assistance in obtaining a more suitable house or employment, the loan of a bed or help in providing for his family during treatment in a sanatorium. Frequently organisations exist which can afford the needful help, and the function of the care committee in these cases is to bring the patient into touch with the appropriate organisation.

Workshops and other schemes, such as the village settlements at Papworth and Preston Hall for the employment of tuberculous workers, are praised by Sir George Newman.

Methods of Treatment.

Of *artificial pneumothorax* in suitable cases he speaks highly, but is less confident as to the benefit obtained from other operative procedures, such as *phrenic evulsion* and *thoracoplasty*. Such methods are anyhow reserved for particularly selected hospital cases, and should be undertaken only by competent and experienced surgeons.

As to the treatment by gold salts, the recent clinical evidence concerning *sanocrysin* is reviewed at some length. It seems clear, he says, that sanocrysin is a form of treatment that is of limited application, and can only be given to carefully selected cases under constant medical supervision, and with due appreciation of its risks and contra-indications. Further experimental work on the effects of *sanocrysin* is being done by Prof. S. L. Cummins at Cardiff, under the auspices of the Medical Research Council.

From time to time the Ministry and the Medical Research Council receive representations from outside which urge the need for new investigations of the clinical value of *tuberculin in the treatment of human* tuberculosis. This question has recently been con-

neutrophilia of suddenly intercurrent sepsis, even where a total leucopenia exists from other causes. These, he says, may be easily missed if it is not the percentage count that is before the physician, although in purely scientific investigations absolute counts must be obtained.—I am, Sir, yours faithfully,

Kew, Dec. 15th, 1928. W. E. HOME.

THE RODS AND CONES.

To the Editor of THE LANCET.

SIR,—Mr. Edridge-Green's letter in your issue of Dec. 15th is anything but convincing. The absence of discussion on a paper at an international meeting may have other reasons than approval, upon which I need not enlarge. In his book on Colour-blindness in the International Scientific Series, Mr. Edridge-Green describes an experiment in support of his theory. It is shortly this: If we view a luminous object through an artificial pupil, a pinhole in a piece of paper, it has a certain brightness. If we move the artificial pupil away from the eye towards the object, the object becomes brighter. The reason is, says Mr. Edridge-Green, by moving the paper away from the eye, more light falls on the translucent sclerotic, more visual purple is liberated, and hence the object appears brighter. This would be in harmony with his theory, but unhappily he has misread the facts. There is a very simple elementary physical explanation for this observation. In moving the pinhole away from the eye towards the luminous object, it is moved towards the apex of the conical pencils of light from all the points of the luminous object—i.e., more light-energy from every point passes through the pinhole, and hence the object appears brighter. Now for a crucial experiment of Mr. Edridge-Green's explanation. I placed an electric bulb, with no current passing, next to my eye, viewed a luminous object through a pinhole and noted its brightness. Then I switched on the lamp. A great amount of light fell on the sclerotic and should have, according to Mr. Edridge-Green's theory, liberated more visual purple and increased the brightness of the object looked at, but *the brightness of the object remained unaltered.* I described, possibly demonstrated, the experiment to Mr. Edridge-Green, some 15 years or so ago at the Psychological Laboratory at University College. He thought it very interesting, but having no time to discuss it then, promised to return and discuss it later. However, this never happened.

A point in favour of v. Kries's theory, and easily observable by everyone, is this: If, when noticing a star of the lesser magnitudes in the peripheral field, we look at it directly (i.e., the star's image then falls on the fovea), it disappears, but as soon as we look at a point near by the star at once appears again in the peripheral field.—I am, Sir, yours faithfully,

Shortlands, Dec. 17th, 1928. A. WOHLGEMUTH.

SACRO-ILIAC PAIN OR SCIATICA?

To the Editor of THE LANCET.

SIR,—On more than one occasion you have allowed me to draw attention in your columns to various aspects of sacro-iliac pain, believing, as I do, that an immense amount of human suffering will be alleviated when pain from this source becomes generally recognised amongst the members of our profession. Then the treatment of pain in the lower part of the back may be placed on a more scientific basis than at the present time. It was therefore with the greatest pleasure that I read the address on sacro-iliac pain by Dr. Wilfred Harris on p. 1230 of your last issue. In this address Dr. Harris states that:

"Its chief sign in sciatica is the production of pain referred along the nerve when the leg is extended on the flexed hip, a sign already claimed by Goldthwait as due to sacro-iliac subluxation."

And then adds that we should—

"limit the value of his sign of sacro-iliac sprain to those cases in which the pain is referred to the actual joint region, whether or no there is also pain referred down the leg."

For many years past I have used this test with a very slight and simple addition which is, I think, conclusive in the differential diagnosis between the two complaints. When the hip is flexed and the knee is extended, the ankle-joint, being in a position of rest, is definitely plantar-flexed. When the movement has reached a stage at which pain is first felt, dorsi-flexion of the foot will lay no extra tension on the ham strings, and therefore on the sacro-iliac joint; while this movement must of necessity increase the tension on the terminal branches of the sciatic nerve. If, therefore, dorsi-flexion of the foot increases the pain in this position, it is safe to make a definite diagnosis of sciatica. If it fails to do so, the chances are very largely that the cause of the pain is due to a lesion of the sacro-iliac joint. Of course, it cannot be too strongly emphasised that the differential diagnosis of pain arising in the lower part of the back is so difficult and so complicated that it is impossible to rely on any one sign, but the sign I am now suggesting has withstood the test in the examination of many hundreds of cases, and it is but rarely that doubt has been thrown on its accuracy by the rest of the examination.

I do not know whether this observation has been published before. If so I am unaware of it, although many know of it, as I have frequently drawn attention to the value of the sign when lecturing on backache and allied troubles during the last seven years.

I am, Sir, yours faithfully,

JAMES MENNELL, M.D. Camb.

Park-crescent, W., Dec. 17th 1928.

CHILLY FEET.

To the Editor of THE LANCET.

SIR,—Repeated chilling of the feet is, no doubt, like other sorts of chilling, a common cause of illnesses of various kinds. Pasteur long ago found out that in poultry it brought on chicken cholera. That is to say, it lowered the resistance of the body so as to convert immunity into liability. I believe that a large proportion of the chills contracted in the winter months commence in the feet and are attributable to unsuitable footwear. We know that unless the leather is of good quality, and properly sewn and waterproofed, a boot or shoe must admit moisture. Feet shod in damp leather suffer from a double adverse exchange. They receive moisture from the ground, and lose heat to the ground. In the warm air of the house the loss of heat by evaporation also chills the feet. Everyone removes damp gloves on coming indoors. If persons with poor circulation always removed their outdoor shoes, like the French peasants, when they come into the house, they would find it easier to keep warm.

The wearer of sabots is in a happier case, for wood is a non-conductor, and sabots or light, well-made clogs, such as are used in gardening, keep the feet surprisingly warm and comfortable. So long as the feet are kept warm moisture is not injurious. Rubber over-shoes or the modern rubber boots over thick stockings keep the feet both dry and warm in winter since rubber also is a non-conductor. The drawback of rubber soles is that moisture is apt to creep in and be retained between the sole and the leather. Half-Wellingtons and high spats are, as is well known, useful for chilly feet in another way. If the ankles are not kept warm the blood-vessels contract and the blood-supply to the feet is diminished. Spats warm the feet and mittens warm the fingers by maintaining the blood-supply.

My reference, in a recent lecture at the Royal Institute of Public Health[1] to the methods of Kneipp at Worishofen has caused some surprise. It does seem

[1] Rheumatism in Relation to Industry. Roy. Inst. of Public Health.

Correspondence.

"Audi alteram partem."

CHRONIC SPASMODIC AFFECTIONS OF THE COLON.

To the Editor of THE LANCET.

SIR,—Dr. Ryle kindly refers to my book upon "Tonic Hardening of the Colon." I feel certain, however, that further study of this subject will show that the term "spasmodic" as applied to the condition referred to is not a satisfactory one even in the case of the small "contracted" colon which is sometimes shown by radiographs. Although spasm of the colon probably does occur it will, I feel sure, be ultimately agreed that the commonest cause of colon hardening is not muscular contraction but a tonic static fixation of some of the muscular fibres, a form of primitive muscular activity allied to the "postural activity" first described by Sir Charles Sherrington. It is, therefore, preferable to describe this condition as simply "tonic hardening" instead of using a term which implies a theory as to the cause of the hardening which further observation may prove to be incorrect.

I feel I must also offer a criticism of Dr. Cawadias's statement that "a precise knowledge of visceral neurology" is necessary for the accurate diagnosis of this condition. For more than 35 years I have noted the degree of hardening of the colon in nearly every patient that I have examined, and I have found that very simple measures suffice to control this so-called "spasmodic" condition when it occurs. As a rule this abnormal hardness of the colon speedily subsides if the patient be given an effective intestinal antiseptic combined with full doses of some drug containing atropine, preferably tincture of hyoscyamus in 20 to 30 minim doses.

In connexion with Dr. Crookshank's remarks as to the efficacy of psychotherapy, I feel sure that if he took two parallel series of cases showing abnormal hardness ("spasm") of the colon and treated the one series by psychotherapy and the other by means of full doses of hyoscyamus, together with salol in 10 gr. doses thrice daily (or, where not contraindicated, the mercury and iron antiseptic) and with proper regulation of the diet, he would find that the latter series would show far better results than the former.

Finally, with regard to Dr. Ryle's criticism that in my book I have overstressed the effect of colon hardening in causing nervous symptoms, I would like to point out that cases of this nature showing mental depression, obsessions, &c., often have no abdominal symptoms whatever, and the colon might be thought to be perfectly normal were it not for the fact that on palpation it was found to be hard and tender. The rapidity with which such cases yield to treatment by an intestinal antiseptic, hyoscyamus, and diet is often quite dramatic.

I am, Sir, yours faithfully,

Birmingham, Dec. 15th, 1928. T. STACEY WILSON.

PURE NEPHROSIS.

To the Editor of THE LANCET.

SIR,—In your account (p. 1240) of the discussion on "Purines as Diuretics" at the Royal Society of Medicine it is stated that I described pure nephrosis "as a functional imitation of what happened in mercuric chloride poisoning." Though I am myself doubtless responsible for this statement, I should be much obliged if you would give me an opportunity of shortly explaining my views on a subject which has greatly interested me. I have formerly had the opportunity of observing rapid recovery in cases of apparently pure nephrosis after many months of "waterlogged" condition, and in one similar case have unfortunately seen death occur following convulsions which supervened just when an intercurrent infection had been apparently recovered from. Such convulsions would have been formerly termed acute uræmic convulsions, though they are now known not to be really uræmic. They are probably due to spreading of the general œdematous process and the onset of intracranial œdema.

What I should have said in my remarks is that pure nephrosis is a disturbance in renal function of the same nature as that which occurs during one stage or degree of mercuric chloride poisoning. The condition of pure nephrosis is possible, I believe, in *only very few individuals*, and is best explained, according to my views, as the result of an idiosyncratic *response on the part of the epithelium of* the convoluted tubules towards certain microbic toxins (in some cases, for instance, the toxin of syphilis, just before the outbreak of ordinary secondary syphilitic manifestations). Non-microbic poisons, such as chloroform, may produce similar "parenchymatous" *disturbance both in the kidney and liver at* the same time.

In microscopic sections of the kidney from rare fatal cases of pure nephrosis (formerly classed as pure parenchymatous nephritis) the glomeruli appear not to be diseased, but the cells of the convoluted tubules are swollen and desquamating and appear to be blocking the dilated tubules. This is the "large white kidney" of pure nephrosis, which is to be distinguished from the "large white kidney" of amyloid disease and from the kidney of "lipoid nephrosis." The cortex of the latter is speckled with lipoid deposits (cholesterol), and also nearly always presents obvious signs of an old interstitial inflammatory process.

In pure nephrosis, according to the view that I am explaining, the swelling of the epithelium of the convoluted tubules is sufficient to partially (very rarely completely) obstruct the outflow of water and sodium chloride from the glomeruli and thus gives rise to the great diminution of urine, the retention of water and sodium chloride, and the general dropsy (waterloggedness) of the clinical picture; whereas just sufficient water probably passes through most of *the convoluted tubules to carry* away the urea excreted by the glandular cells of the tubules and thus prevent its undue accumulation in the blood.

In such matters mechanical explanations are not to be lightly accepted, but it seems to me that one is driven to some such theory as the above, which is after all very similar, I believe, to that most generally held at present.

I am, Sir, yours faithfully,

London, W., Dec. 16th, 1928. F. PARKES WEBER.

THE MODE OF EXPRESSING THE DIFFERENTIAL LEUCOCYTE COUNT.

To the Editor of THE LANCET.

SIR,—As the question of absolute or percentage leucocyte counts has been raised, I would say that Prof. Schilling has discussed this matter in a book[1] to which I called your readers' attention a few weeks ago. Schilling there remarks that absolute counts were proposed by Naegeli and others, but he discourages them in clinical work on the ground that they are obtained by combining two estimations (total and differential), neither of which is perfectly accurate, so that the results are the less certain. Moreover, the calculations involved will retard the receipt of the blood count, which the clinician wants as soon as possible as conditions change so quickly. There is another point. The absolute expression of the white cells sometimes makes the result of relative changes less apparent; Schilling instances the small relative neutrophilia of acute tubercle whether the total leucocytes are many or few, the relative monocytosis of malaria, and the persistently high relative

[1] Das Blutbild, 1926, p. 165; see THE LANCET, Nov. 24th, p. 1104.

Obituary.

WILLIAM SMITH KERR, M.B., F.R.C.S. EDIN.

THE sudden death of Mr. W. S. Kerr deprives the medical profession in Sheffield of one of its most able members. The son of a doctor—William Smith Kerr, M.D., of Dumfries—he was born in 1869 and educated at Dumfries Academy and the University of Edinburgh. Graduating as M.B. in 1890 he returned to his own town as house surgeon to the Dumfries and Galloway Royal Infirmary, whence he found his way to Sheffield in 1891. At the Sheffield Royal Infirmary he remained as house surgeon, junior and senior, until 1895, when he resigned and started practice in Brookhill. Not long afterwards he joined the late Mr. Harry Lockwood in general practice, and after obtaining the Fellowship of the Royal College of Surgeons of Edinburgh in 1903 he was appointed by the infirmary authorities to found and take charge of the ear, nose, and throat department. Up to this time such work had been done by the general surgeons, but Kerr soon created a large out-patient department and found himself cramped for want of in-patient beds. As a reward of his untiring service and skill he lived to see a splendid block—the Princess Mary block—built for his special surgery, and there he worked during his last three years.

MR. W. S. KERR.

"He was honoured and most beloved," writes a medical friend, "because the foundation-stones upon which his character was built were devotion to duty and devotion to his fellow men. His was a personality brimming over with goodwill and kindly sympathy, which compelled the affection of everyone who knew him. No professional colleague ever spoke of him but in terms of sincere affection, and no patient ever thought of him but as a friend in time of need. It was perhaps in his dealing with children that this side of his character was most evident. No one who had witnessed the way in which he could win the confidence of a child and dispel all fear could fail to see that a great love of his fellows was the source of his power. Anything selfish in word and deed was completely foreign to his nature, and to those who knew him inconceivable. He was, moreover, firm and resolute in any course which he thought to be right and devoted heart and soul to his specialty. Quite apart from their personal regard his skill and efficiency were such as to command the complete confidence of colleagues and patients alike."

At the outbreak of war Mr. Kerr joined the Sheffield City Battalion as its first medical officer, but was subsequently transferred to the 23rd West Riding R.A.M.C. Ambulance, which he commanded in France. He returned home on account of ill-health, but became successively inspector of ambulances in the Eastern Counties and surgeon specialist to the 4th Northern General Hospital. He married Edith, daughter of Dr. C. S. Blythman.

FRANCIS WASHINGTON EVERARD HARE, M.D. DURH.

Dr. Francis Hare, who died at Beckenham on Dec. 9th after six days' illness, was a recognised authority on alcoholism, and had devoted nearly 30 years to the study of this addiction. Born at Dublin in 1858, the son of Matthias Hare, LL.D., he was educated at Fettes, and went to London as a medical student, first at St. Mary's and later at St. Thomas's Hospital. Taking the diploma of M.R.C.S. in 1879 he gained post-graduate experience at Newcastle Royal Infirmary, and graduated as M.B. Durh. in 1884, proceeding to the M.D. degree seven years later. After serving for some time as a ship's surgeon he settled in Queensland, Australia, where he was appointed medical superintendent of Charters Towers District Hospital, and acted for a time in the same capacity at Brisbane General Hospital. In course of time he became a consulting physician to the latter institution, and he also held the office of inspector-general of hospitals for the State. Although he did a considerable amount of general surgery and ophthalmic work in Australia, his chief interest lay in medicine, and when in 1904 he came home on grounds of health he found a congenial opening for his abilities in the post of medical superintendent of Norwood Sanatorium. This institution moved to Beckenham in 1909, and Hare was associated with it until three years ago. At this time he was in poor health; nevertheless he started a nursing home in Beckenham where with a colleague he was able to carry on the work to which he had been so long devoted. A pioneer in his specialty he was the author of a standard text-book on the clinical aspects and treatment of alcoholism, which was published in 1915. His knowledge and experience were wide, and where patients were concerned he was indefatigable and did not recognise defeat. A medical friend writes of him that he never complained of his own suffering, which was often intense, but always carried on, "his one interest being a successful cure or an improvement in a new patient. He was a man who made few friends, but his friendship was an invaluable one."

Dr. Hare married, in 1902, Ethel Maud, daughter of George Theodore Bell, of Brisbane.

JOHN McASKILL HENDERSON, M.B. EDIN., D.SC. ABERD.

Dr. J. M. Henderson, who died at Nairobi on Nov. 22nd, was born in Ayr in 1895, and had a distinguished career in the University of Edinburgh, where he graduated in arts, science, and medicine. He was prominent in the social life of the University, and was for varying periods president of the S.R.C., the Union, and of the Celtic Society. During the war he was employed as a chemist in a munition factory, having been rejected for military service. He graduated as M.B. in 1922, and after engaging for some time in general practice in Glasgow decided to take up research as a career. He went to the Rowett Institute at Aberdeen at the end of 1923 and studied the effects of ultra-violet light on metabolism and on problems connected with lactation. He had just begun to work on the metabolism of iodine when he went out to Kenya, along with other medical and agricultural graduates from Aberdeen, in charge of the medical team conducting an inquiry into nutritional problems in that colony. His work there was characterised by the same enthusiasm, thoroughness, and sound judgment as he had shown at Aberdeen, and it has thrown a new light on many problems concerning the health of the native. He had just wound up his experiments and was about to leave for

absurd to advocate the conservation of heat and also the exposure of the feet to cold. But physiology teaches that *in health* exposure to cold, especially when accompanied with muscular exercise, stimulates the circulation and increases metabolism throughout the body. For this reason walking barefoot in the grass may be beneficial for chilly persons. But all depends on the reaction produced. Cold, as a provocative of heat, must be used in measured doses. To obtain good results, not only the feet but the whole body must be *warmed by the cold*. There is a saying that "to maintain an agreeable warmth of the skin is one of the great secrets of health." To this I would add that those who keep their feet warm seldom suffer from chills or consequent catarrhs. I should like to know if this is a general experience.

I am, Sir, yours faithfully,

R. FORTESCUE FOX.

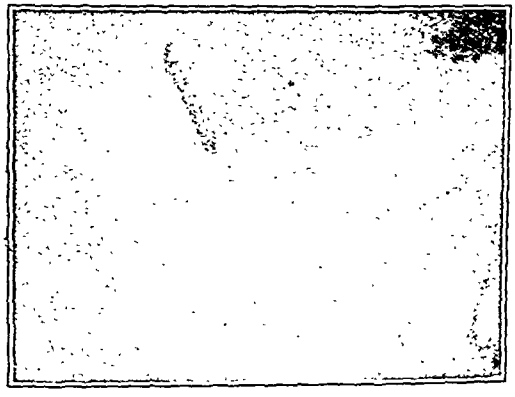
Devonshire-place, W, Dec. 6th, 1928.

SHOT IN THE VERMIFORM APPENDIX.

To the Editor of THE LANCET.

SIR,—The cases reported by Prof. John Fraser and others in your columns (THE LANCET, Dec. 1st and 8th) recall to my mind a patient admitted to the North Staffordshire Royal Infirmary on July 27th, 1926.

He gave a history of vague discomfort in the right iliac fossa, occasionally exaggerated into attacks of acute pain resembling renal colic and associated with frequent micturition and the passage of blood in the urine. Microscopic examination of the urine by his own doctor revealed an excessive number of *Bacillus coli*, with which diagnosis he was admitted to the North Staffordshire Royal Infirmary. Radiography showed a long, opaque outline in the region of the appendix (see figure), which caused considerable



doubt as to whether it was due to a calculus in the ureter or a solid concretion in the appendix. Opinion was divided, but the radiologist, Dr. A. H. John, of Stoke-on-Trent, was certain that the shadow was external to the line of the ureter. There was only a slight tenderness on deep palpation, and Bastedo's sign was persistently negative. There was no leucocytosis.

An operation was performed by Mr. George Blair on August 6th. The appendix was found free and successfully removed, and on section showed it to contain 42 pellets similar to those in the case reported by Prof. John Fraser. Recovery was uneventful, and the patient was discharged on August 23rd, 1926, to his work as a gentleman's chauffeur.

It was ascertained that in his capacity as chauffeur this man was often utilised as a beater, and was, accordingly, privileged to receive many gifts of game: and in no other way could he account for the swallowing of pellets than by the rapid bolting of his food. It is interesting that the symptoms he complained of were suggestive of an inflammatory condition of the urinary tract rather than trouble in the appendix. Since the operation his health has remained good, and no further pain on micturition and no further blood in the urine has been noted.

I am, Sir, yours faithfully,

A. WILSON GILL.

Hanley, Stoke-on-Trent, Dec. 13th, 1928.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

THE following appointments are notified:—Surg. Comdrs: J. D. Murphy to *Courageous*; J. C. Sinclair to *Birmingham*; B. R. Bickford to *Vivid*; W. G. Thwaytes to *Nelson*; J. G. Danson to *President* for three months' post-graduate course; H. L. P. Peregrine to *Adventure*; C. F. O. Sankey to *Victory*; A. A. Sanders to *Benbow*; J. M. Horan to *Vulcan*; J. F. M. Campbell to *Berwick*; A. G. Malcolm to *Egmont*; M. J. Aitken to *Cardiff*; and J. G. Boal to *Tamar*.

ROYAL NAVAL VOLUNTEER RESERVE.

Prob. Surg. Lt. H. P. Widdup is confirmed in his rank.

ROYAL ARMY MEDICAL CORPS.

The undermentioned Lt.-Cols. retire on ret. pay: P. C. Douglass, B. R. Dennis, and C. A. J. A. B. Foote.

The undermentioned Majs. to be Lt.-Cols.: G. G. Tabuteau, vice Lt.-Col. P. C. Douglass, to ret. pay, and J. M. B. Rahilly, vice Lt.-Col. B. R. Dennis, to ret. pay.

ARMY DENTAL CORPS.

Maj. J. G. Worsley, having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

ARMY RESERVE OF OFFICERS.

A. W. Davidson to be Lt.

TERRITORIAL ARMY.

Col. J. G. Martin vacates the appt. of A.D.M.S. 55th (W. Lan.) Div.

Lt.-Col. (Bt. Col.) D. C. L. Orton, from Gen. List, R.A.M.C., to be Col., and to be A.D.M.S. 55th (W. Lan. Div.).

Capt. N. F. C. Burgess to be Capt.

ROYAL AIR FORCE.

The undermentioned Flight Lts. are transferred to the Reserve, Class Dii: E. A. Aslett and W. Parsons.

Temp. Capt. A. R. H. Bennett (General List, Army, Dental Surgeon) is granted a temporary commission as a Flight Lt. on attachment to the R.A.F.

Flight Lt. H. J. Procter is promoted to the rank of Squadron Leader (Dental) on promotion to the rank of Major in the Army Dental Corps.

The undermentioned Flying Officers (Temp. Lts., General List, Army) are promoted to the rank of Flight Lts. (Dental) on promotion to the rank of Temp. Capt. in the Army: H. I. Clapperton and A. P. McClare.

RESERVE OF AIR FORCE OFFICERS.

Flight Lt. L. Game resigns his commission on appointment to a commission in the Royal Army Medical Corps.

Flight Lt. B. C. W. Pasco relinquishes his commission on completion of service.

INDIAN MEDICAL SERVICE.

Capt. Homi Rustomji Cursetji to be Maj.

Lt.-Col. J. B. D. Hunter retires.

Temp. Capt. Bhagat Ram Tandon relinquishes his temp. commission and retains his rank.

COLONIAL MEDICAL SERVICES.

The following appointments have been made by the Secretary of State for the Colonies during the month of November: C. Burnett, J. Crawford, C. S. Davies, and W. C. Dale, medical officers, West African Medical Staff; R. A. McNab and C. H. Swapp, medical officers, Straits Settlements.

ROYAL ARMY MEDICAL COLLEGE.

The following prizes have been awarded to officers of the last junior officers' class at the Royal Army Medical College, London:—

Herbert Prize (for highest aggregate) and First Montefiore Prize in Military Surgery: Lieut. L. S. S. Lucas, L.M.S., St. Thomas's. Second Montefiore Prize in Military Surgery: Lieut. G. L. Grieve, R.A.M.C., Glasgow University. Randall Martin Prize in Tropical Medicine: Lieut. M. R. Stevens, L.M.S., Cambridge and St. Bartholomew's. Parkes Memorial Prize in Hygiene: Lieut. G. L. Grieve, R.A.M.C., and Lieut. H. W. Farrell, L.M.S., University College, Dublin (equal). Tulloch Memorial Prize in Pathology: Lieut. A. T. H. Marsden, R.A.M.C., Durham University. Favrer Memorial Prize in Pathology: Lieut. V. E. M. Lee, L.M.S., Royal College of Surgeons, Ireland. Marshall Webb Prize (medical administration): Lieut. A. T. H. Marsden, R.A.M.C.

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Aberdeen to see to the publication of his results when he contracted the disease that proved fatal to him. While his results remain as a contribution to medical science, the ideas derived from them by a foreseeing and constructive mind lie buried with him. He was always able to express these ideas in precise and lucid English, and his ability as a speaker will be long remembered. A man of wide interests and a broad mind, he was well versed in literature, music, and art, and was himself no mean draughtsman. His ready wit, his great fund of anecdotes, and amiable personality will be missed in the many social gatherings he attended. He leaves a widow.

JOSEPH PRIESTLEY, M.D. EDIN., D.P.H.

THE sudden death of Dr. Joseph Priestley on Dec. 15th came as a shock to his many friends. It is only a few months since the expression of keen regret on the part of all sections of the community at his enforced retirement by age-limit from the position of medical officer of health of Lambeth which he had worthily held for the long period of 32 years. These expressions of regret were accompanied by quite an unusual number of valuable presentations, and one from the medical practitioners of Lambeth gave especial pleasure to the recipient and indicated the very good feeling which always existed between Dr. Priestley and his colleagues.

DR. J. PRIESTLEY.

Joseph Priestley was a direct descendant of the famous theologian and man of science whose name he bore. He was already a graduate in arts of London University before he went to Edinburgh for his medical course. In 1883 he took his M.B. Edin., with a gold medal in medical jurisprudence and a prize in public health, and three years later his thesis for the M.D. was commended. After qualification Priestley obtained a wide range of clinical experience, for he was house surgeon to the Manchester Royal Infirmary, clinical assistant at Brompton, Great Ormond-street, and the Royal Westminster Ophthalmic Hospitals, and interne at the Rotunda. For a while he was in practice at Twickenham where he acted as medical referee to a number of insurance societies, was medical officer to Bath House School, and lectured for the St. John Ambulance Association. After a period as assistant medical officer of health at Camberwell he was appointed medical officer and public analyst to the Borough of Leicester. When he came to Lambeth Dr. Priestley had accordingly already made his mark as an outstanding sanitarian by his good work in Leicester in a similar position, and his energetic advocacy of environmental hygiene, and especially his crusade against the abominations of the so-called conservancy system, accepted at that time as inevitable, must be fresh in the recollection of many residents of that city. For many years Dr. Priestley took an active and leading part in the work of the Royal Sanitary Institute, and for at least two decades he was one of the secretaries of the Society of Medical Officers of Health. He was a foreign member of the Société d'Hygiène.

During his tenure of office at Lambeth Dr. Priestley saw many changes in the nature of the public health services, as was natural owing to the greater attention given nowadays to the individual, and he showed in his final report for 1927 (reviewed in another column) how a large staff could gradually be built up, and the remarkable contrast between the present mortality statistics and those of 1895, when he was first appointed to the parish of St. Mary's, Lambeth. Among his more noteworthy writings is a report on the physical condition of the working classes (1912), and articles on house drainage, infantile mortality, and small-pox epidemics in ill-vaccinated communities. Dr. Priestley left Lambeth in a very much better sanitary condition than he found it. This is not the place to attempt to evaluate the effect of the various public health measures he introduced. The verdict of his compeers is that Joseph Priestley was an able and hardworking leader in a hygienic movement which has resulted in great benefit to the health of London and that he had in large measure the gift of getting the reforms which he visualised translated into practice.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

LOCAL GOVERNMENT BILLS: FINANCIAL RESOLUTIONS.

IN the House of Commons on Friday, Dec. 14th, the financial resolutions in connexion with the Local Government Bill and the Local Government (Scotland) Bill were agreed to on report.

HOUSE OF COMMONS.

WEDNESDAY, DEC. 12TH.

Orthopædic Treatment of School-children.

Mr. THOMAS GRIFFITHS asked the President of the Board of Education whether, in view of the urgency for more beds for treatment for orthopædic diseases in children from the elementary schools in Hampshire, he would consider payment of a grant on any further expenditure incurred to provide more beds over the 12 beds now allotted for this purpose by local generosity at the Treloar Cripples' Home at Alton.—Lord EUSTACE PERCY replied: The Hampshire Education authority are, I understand, examining the question of extending their arrangements for orthopædic treatment for school-children in their area. I am prepared to consider sympathetically any proposals for such extension which the authority may see fit to formulate. Grant will be payable on expenditure for this purpose approved by the Board in the ordinary way.

Poor-law Authorities and Medical Treatment.

Viscountess ASTOR asked the Minister of Health what amount the poor-law authorities had spent for each of the last three years for which figures were available on such treatment of the sick as would be transferred to the public health authorities under the Local Government Bill.—Sir KINGSLEY WOOD (Parliamentary Secretary to the Ministry of Health) replied: I am afraid that exact figures are not available, but the approximate expenditure of poor-law authorities on the services mentioned in the question was £9,150,000, £9,530,000, and £10,160,000 in the years 1924–25, 1925–26, and 1926–27 respectively. These figures include expenditure on the maintenance of persons in poor-law institutions, for persons suffering from disease of body or mind, and in the sick and infirm wards of other poor-law institutions, and on domiciliary medical relief.

Lotteries for Hospitals.

Commander BELLAIRS asked the Home Secretary whether the Government would consider the question of issuing licences for lotteries in aid of hospitals, charities, &c., in view of the differences of police action in various parts of the country since various decisions in the High Court as to Lottery, Gaming, and Betting Acts.—Sir W. JOYNSON-HICKS replied: All public lotteries are unlawful, whether for charity or otherwise, and I have no authority to grant exemption from the law. This would require fresh legislation.

Road Accidents and the Provision of Mortuaries.

Mr. ALBERY asked the Minister of Transport whether he was aware of the fact that the numerous fatal accidents resulting from the increased use of the roads were causing concern to many local authorities and parish councils who were without the use of any mortuary; and that it was becoming increasingly difficult to find suitable accommodation after such fatal accidents; and whether he had consulted with the Home Secretary and the Minister of Health with a view to issuing fresh regulations on this subject or to varying in any way the present instructions.—Mr. CHAMBERLAIN (Minister of Health) replied: Local authorities under the Public Health Act, 1875, have full powers to provide mortuaries, and where there is need for further accommodation representations should be made to the appropriate local authority. I am not aware that any instructions or regulations have been issued dealing with this matter.

Schools of Medicine and Women Students.

Sir ROBERT THOMAS asked the Minister of Health the number of schools of medicine in London and the rest of the country respectively from which women were excluded; and whether, in view of the increasing need of women with medical knowledge, he would set up an inquiry with a view to removing these restrictions.—Sir KINGSLEY WOOD replied: My right hon. friend has no official information on this matter, but he understands the position outside London to be that there is no restriction on the admission of women to medical schools. The position in London already forms the subject of an inquiry initiated by the University of London.

Dr. WATTS: Is it not a fact that the medical profession is already overcrowded and that there are many men who cannot find anything to do?

No answer was given.

THURSDAY, DEC. 13TH.

Silicosis and Workmen's Compensation.

Mr. DAVID GRENFELL asked the Home Secretary whether the regulations for granting compensation to men disabled by silicosis would provide for those cases where total disability had already been proved to be due to this form of occupational disease.—Sir W. JOYNSON-HICKS replied: No, Sir. I am advised that I should have no power under the Act to give this scheme any such retrospective application.

Poor-law Relief in Glamorgan.

Mr. GEORGE HALL asked the Minister of Health the number of persons in receipt of poor relief in the county of Glamorgan on the latest available date, and for the corresponding date for the years 1913, 1925, 1926, and 1927 respectively; and if he would give the figures for each poor-law union separately.—Mr. CHAMBERLAIN replied: The following is the table asked for:—

Name of poor-law union.	Number of persons in receipt of poor-law relief (excluding lunatics in asylums, casuals, and persons in receipt of domiciliary medical relief only) on the last Saturday in November.				
	1913.	1925.	1926.	1927.	1928.
Bridgend and Cowbridge	1,878	9,904	33,313	5,070	4,588
Cardiff	5,090	13,521	18,575	13,878	11,314
Gower	240	360	918	356	361
Merthyr Tydfil ..	4,080	22,018	65,077	12,621	14,424
Neath	3,027	10,297	29,191	8,662	8,152
Pontardawe	704	1,174	7,422	1,289	1,308
Pontypridd ..	6,903	30,180	82,389	18,307	20,337
Swansea	3,625	6,057	14,596	8,195	6,157
Totals for Union County of Glamorgan	25,547	93,511	251,481	68,378	66,941

School Dental Service in Wales.

Sir ROBERT THOMAS asked the President of the Board of Education what was the number of schools in Wales which had a dental service; how many dentists were employed; the number of children who had their teeth inspected during the last school year; the number who received treatment; and the estimated total cost.—Lord EUSTACE PERCY replied: I am unable to state the number of schools in Wales which have a dental service, but the number of schools at which authorities undertaking dental treatment is 27 out of a total of [illegible]. The number of dentists employed is 45. The number of children dentally inspected during 1927 was 162,605, and the number treated 68,345. The total cost of the salaries of the school dentists was, approximately, £18,000, and additional expenditure was incurred for travelling expenses, premises, equipment, dental attendants, &c.

Grants for Maternity and Child Welfare.

Mr. BRIGGS asked the Minister of Health what was the amount of the grants given last year for maternity and child welfare.—Mr. CHAMBERLAIN replied: The amount of the grants for maternity and child welfare paid in the last financial year out of the vote for the Ministry of Health was, approximately, £1,040,000, including about £16,000 in respect of the training of midwives and health visitors.

Mr. BRIGGS: Would my right hon. friend welcome the receipt of further money from the Treasury for these purposes?—Mr. CHAMBERLAIN: Yes, I should always welcome money from the Treasury for these grants.

Mr. MARCH: Has the right hon. gentleman given notice to any of these maternity and child welfare centres to reduce the amount they are now allowed for expectant mothers?—Mr. CHAMBERLAIN: No distinction is drawn.

Government Grant to Cambridge University.

Sir HARRY BRITTAIN asked the Chancellor of the Exchequer whether it was proposed to offer the University of Cambridge a grant towards the sum required to enable it to accept the offer of the International Education Board of the Rockefeller Foundation; and, if so, of what amount.—Captain BOWYER replied: The Government have decided to offer to the University a grant of £50,000 subject, of course, to the provision of funds by Parliament. They believe that the highest national as well as imperial and international interests demand that the great scheme made possible by the generous benefaction of the International Education Board should be fully carried into effect for the advancement of agriculture and of the fundamental sciences on which agriculture depends.

Caseous Lymphadenitis in Imported Mutton.

Mr. WILLIAM THORNE asked the Minister of Health the terms of the clauses in the Foreign Meat Regulations dealing with the disease of caseous lymphadenitis in imported mutton, and the instructions to inspectors of meat and food when carcasses were found to be infected; and whether the whole carcass or only the affected parts had to be destroyed.—Mr. CHAMBERLAIN replied: The effect of Articles 7, 8, and 9 of the Public Health (Imported Food) Regulations is that the medical officer of health of a port, or riparian sanitary authority, may examine imported meat and apply to a justice to order its condemnation if he is of opinion that it is diseased, or unsound, or unwholesome, or unfit for human consumption. A memorandum issued by my department as to the criteria to be adopted in the inspection of meat recommends the condemnation of the entire carcass and all the organs if evidence of caseous lymphadenitis is found.

MONDAY, DEC. 17TH.

Sickness among Women Clerks.

Miss BONDFIELD asked the Minister of Health what was the average number of days sick leave per head per annum taken by women in the writing assistant, typing, and clerical grades, respectively, in the Ministry of Health during the years 1925, 1926, and 1927; and what was the average number of days sick leave per head per annum in the case of each grade concerned taken on account of nervous troubles.—Mr. CHAMBERLAIN replied: The average number of days sick leave per head per annum taken by women in the writing assistant, typing, and clerical grades, respectively, in my department, during the years 1925, 1926, and 1927, was as follows:—

	1925.	1926.	1927.
Writing assistants ..	12·8	9·5	10·5
Typing staff—			
(a) Established ..	19·0	16·6	13·6
(b) Unestablished ..	13·9	10·2	13·2
Clerical Officers	13·2	11·8	13·9

I regret that I am unable to give the information asked for in the last part of the question, as it could not be obtained without an undue amount of time and labour.

Miss BONDFIELD asked the President of the Board of Education what was the average number of days sick leave per head per annum taken by women in the typing and clerical grades, respectively, in the Board of Education during the years 1925, 1926, and 1927; and what was the

average number of days sick leave per head per annum in the case of each grade concerned taken on account of nervous troubles.—Lord EUSTACE PERCY replied: The answer to the first part of the question is contained in the following statement:—

Leave year ending—		Days per head per annum.
Jan. 31st, 1926 ..	.. Clerical	14·6
	.. Typing	13·1
Jan. 31st, 1927 ..	.. Clerical	10·7
	.. Typing	10·6
Jan. 31st, 1928 ..	.. Clerical	12·5
	.. Typing	8·5

With regard to the second part of the question, the information asked for is not available.

Street Accidents to Children.

Mr. DAY asked the Home Secretary the number of street accidents to children for the 12 months ended to the last convenient date.—Sir V. HENDERSON (Under Secretary to the Home Office) replied: I can only give the figures for London (Metropolitan Police District and City of London). The figures for the 12 months to Sept. 30th last are: killed 238, and injured 10,877.

Medical News.

UNIVERSITY OF OXFORD.—At a congregation on Dec. 17th the following degrees were conferred:—

D.M.—A. Q. Wells.

B.M.—G. G. Hill, J. C. Neely, Joyce Wright, and Margaret A. L. Herbertson.

UNIVERSITY OF LONDON.—At recent examinations the following candidates were successful:—

THIRD EXAMINATION FOR M.B., B.S.

Honours.—G. W. Ayres (*d*), St. Mary's Hosp.; Elizabeth Cooper (*b*), London (R.F.H.) School of Medicine for Women; H. P. Himsworth (*a, b, e*, University Medal), Univ. Coll. Hosp.; C. A. Keele (*a*), Middlesex Hosp; G. W. Rake (*a, d*), Guy's Hosp.; and R. W. Reid (*b, d*), St. Thomas's Hosp.
(*a*) Distinguished in medicine; (*b*) in pathology; (*d*) in surgery; (*e*) in midwifery.

Pass.—S. I. Abrahams, Guy's Hosp.; G. T. Allerton, London Hosp.; Sophia Antonovitch, London (R.F.H.) School of Medicine for Women; Harris Avery, Charing Cross Hosp.; Olwen R. Binyon, St. Mary's Hosp.; G. W. Black, Middlesex Hosp.; G. N. Box, St. Thomas's Hosp.; Marjorie F. Brierley, Univ. Coll. Hosp.; Emily E. Cass and Stuart Craddock, St. Mary's Hosp.; W. P. M. Davidson, St. Bart.'s Hosp.; John Davies, Westminster Hosp.; S. J. M. De Navasquez, Guy's Hosp.; Irene Dixon, Charing Cross Hosp.; Marjorie M. Dobson, London (R.F.H.) School; C. P. Donnison, London Hosp.; Elsie M. Douglas, Univ. Coll. Hosp.; David Ellis, Guy's Hosp.; Alexandra G. H. English, London (R.F.H.) School; M. R. Ernst, St. Bart.'s Hosp.; Horace Evans, London Hosp.; Geraldine W. Everett, London (R.F.H.) School; A. P. Farmer, St. Thomas's Hosp.; A. McK. Fleming, Middlesex Hosp.; G. G. Gillam, Univ. Coll. Hosp.; Helen M. Herbert and Alice D. M. Hodge, London (R.F.H.) School; Muriel S. Hulke, Univ. Coll. Hosp.; Philip Inwald, Middlesex Hosp.; I. J. Jones, St. Thomas's Hosp.; R. M. Jones and D. F. Kanaar, Guy's Hosp.; E. M. Lourie, Univ. Coll. Hosp.; Samuel McGladdery, St. Bart.'s Hosp.; Murdo Mackenzie, Guy's Hosp.; Hugh Mannington, Middlesex Hosp.; W. H. Miller, Guy's Hosp.; M. B. Mody, Univ. Coll. Hosp.; C. F. Moore, St. Bart.'s Hosp.; G. E. B. Payne and Mary E. Pease, Univ. Coll. Hosp.; David Preiskel, St. Bart.'s Hosp.; Morris Rothkopf, Middlesex Hosp.; Clarice A. Skidmore and C. F. J. Smith, St. Mary's Hosp.; Edith J. L. Smith, London (R.F.H.) School; E. R. Smithard, Middlesex Hosp.; Eileen R. B. Snow, London (R.F.H.) School and St. Mary's Hosp.; J. G. Thwaites, St. Thomas's Hosp.; Phyllis D. Towell, London (R.F.H.) School; Scott-Russell Trick, Guy's Hosp.; Gladys M. Tullidge, London (R.F.H.) School and St. Mary's Hosp.; A. G. Watkins and A. R. N. Whitlow, Univ. Coll. Hosp.; P. C. Wickremesinghe, Guy's Hosp. and Ceylon Med. Coll.; L. A. Willmott, St. Bart.'s Hosp.; Jessie Wiltshire, Univ. Coll. Hosp.; Elsie E. Wright, St. Mary's Hosp.; and Winifred M. Wright, London (R.F.H.) School.

The following have passed in one of the two groups of subjects:—

Group I.—Nancy M. Badeley, London (R.F.H.) School; S. W. Barber, St. Bart.'s Hosp.; Annie G. Busher and Beatrice A. Butterworth, London (R.F.H.) School; K. J. H. Davies, Guy's Hosp.; Hilda C. Dean, Charing Cross Hosp.; C. J. Donelan, St. Bart.'s Hosp.; Mark Footerman, Univ. Coll. Hosp.; A. P. Gaston, St. Bart.'s Hosp.; H. N. W. Harley, Guy's Hosp.; Kathleen Horne, Univ. of Leeds; Philip Kaplin, St. Mary's Hosp.; G. H. Livingstone, King's Coll. Hosp.; J. F. Mackenzie, Guy's Hosp.; K. W. Mackie, St. Bart.'s Hosp.; Hermia M. Mills, London (R.F.H.) School; M. L. Mistri, Grant Med. Coll., Bombay, and Guy's Hosp.; Doreen G. C. Nixon, Univ. of Bristol; Joan M. Oldaker, London (R.F.H.) School; and S. A. Wickramasinghe, Ceylon Med. Coll. and St. Bart.'s Hosp.

Group II.—Lucy E. Arthur, London (R.F.H.) School; John C. H. Avery, St. Mary's Hosp.; E. C. B. Butler, London Hosp.; E. O. Harris, Middlesex Hosp.; Dorothy P. Hytch, London (R.F.H.) School; J. V. Macgregor, Univ. Coll. Hosp.; Joyce Morgan, Westminster Hosp.; D. T. R. Morris, Univ. Coll. Hosp.; C. B. Picken and H. W. A. Post, Guy's Hosp.; H. G. G. Robertson, St. Thomas's Hosp.; Elizabeth H. Scurfield, London (R.F.H.) School; E. J. J. Smith, St. Bart.'s Hosp.; P. A. M. Soutter, Westminster Hosp.; Frances J. Vinter, London (R.F.H.) School; W. H. S. Wallace, St. Thomas's Hosp.; A. J. Watson, Middlesex Hosp.; J. W. Wigg, E. A. Wood, and B. A. Young, Univ. Coll. Hosp.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At the Primary Examination for the Fellowship held from Dec. 4th to 14th, 168 candidates presented themselves and 45 were approved. The following are the names and medical schools of the successful candidates:—

A. Ali, M.R.C.S., Cairo and London; R. M. Alderton, London; M. A. E. Anous, M.B., Cairo and St. Mary's; E. T. Bannister, Univ. Coll.; J. H. B. Beal, Oxford and St. Bart.'s; F. Bicknell, Oxford and St. Thomas's; G. H. H. Booth, M.B., Manchester; G. N. Clark, M.B., Aberdeen; A. C. Copley, M.B., Cambridge and Guy's; D. Davidson, Univ. Coll.; J. R. Dogra, M.B., Lahore and Middlesex; L. P. J. Evans, Cambridge and St. Bart.'s; F. G. Fenton, M.B., Melbourne and Middlesex; M. L. Formby, M.B., Adelaide and St. Mary's; R. L. Forsyth, M.B., Dublin and Roy. Coll. Surg., Ireland; F. Forty, M.B., Univ. Coll. and Middlesex; A. C. Frazer, St. Mary's; T. Giblin, M.B., Melbourne and Middlesex; A. J. B. Goldsmith, Middlesex; R. Grainger, M.B., Belfast; J. I. Griffiths, M.B., Cardiff and King's Coll.; H. E. Harding, London; C. H. S. Harris, St. Bart.'s; A. Helmy, M.R.C.S., St. Thomas's and King's Coll.; T. V. Jacob, M.B., Bombay and King's Coll.; E. F. King, M.B., Bristol; R. [illegible] and Middlesex; S. [illegible] J. G. Milner, B.Ch[illegible] Murray, Cambridge [illegible] St. Bart.'s; M [illegible] and J. H. Peel, Oxford and King's Coll.; [illegible] d Middlesex; A. S. Rajasin[illegible] King's Coll.; A. de W. Ran[illegible] D., Durham; J. G. Sandrey, [illegible] M.B., Leeds and Middlesex; G. V. Stephenson, M.D., Belfast and London; N. C. Tanner, Bristol; T. Thornton, M.B., St. Andrews and [illegible] Cambridge and St. Bart.'s; J. G. [illegible] St. Thomas's and St. Mary's; [illegible] M.B., Glasgow and Middlesex.

UNIVERSITY OF EDINBURGH.—At a graduation ceremonial on Dec. 14th the following degrees were conferred:—

M.D.—A. M Affleck, Henry Buist, A. H. Campbell, J. L. Chisholm, †E. C. Ellis, *A. M. M. Grierson, S. E. Kark (in absentia), D. R. Lewis, †Neil Macleod, Rosemary O. Morris, H. A. Murray (in absentia), †B. R. Nisbet, *D. H. Paterson, †Alison Ritchie, Archibald Ronald, *Jessie C. B. Sym, †A. B. Walker, †John Ware, and Alexandra A. Warnock (in absentia).
* Highly commended for thesis. † Commended for thesis.

M.B., C. [illegible] Philip Belnart, G. M. [illegible] Correa, Rober[illegible] Isaac Karro[illegible] Jaffey, James [illegible] deholl, Andrew [illegible] J. S. O. Taylor, and W. P. Wallace.
‡ With honours.

UNIVERSITY OF LIVERPOOL.—At recent examinations the following candidates were successful:—

M.D.

T. A. Clarke, R. W. Eldridge, J. E. Howie, D. U. Owen, Helen Standring, and A. G. Wilkinson.

M.B. AND CH.B. WITH HONOURS.

Class II.—*Elizabeth B. Robson, and *E. L. Rubin.

FINAL EXAMINATION FOR M.B. AND CH.B.

Part III.—A. E. Adams, N. J. Crawford, J. H. St. B. Crosby, A. Dala, J. E. Jones, L. de Jongh, Hilda M. C. MacMahon-Garry, *J. S. Mather, C. T. Mercer, G. W. Molyneux, E. E. Prebble, Ivy H. Rowlands, G. A. Talwrn-Jones, and F. J. Welton.
* With distinction in surgery.

Old Regulations, Part I.—A. Gardner, Teresa Lightbound, and R. G. Walker. *Part II.*—F. J. H. Crawford, and A. M. Russell.

UNIVERSITY OF MANCHESTER.—At recent examinations the following candidates were successful:—

FINAL EXAMINATION FOR M.B. AND CH.B.

Alice M. Butterworth, I. M. Hughes, E. P. Johnson, J. S. Miller, J. W. Murray, Evelyn I. M. Sheppard, R. F. Stubbs,

Raymond Whitehead, R. T. Wimmer, and Frederick Wraith.

Forensic Medicine.—Leslie Bold, Christobel M. Hall, E. Z. Levy, A. S. McGowan, and Alan Taylor.

Hygiene and Preventive Medicine.—Leslie Bold, Christobel M. Hall, E. Z. Levy, A. S. McGowan, J. H. Pattyson, E. J. B. Sewell, and Alan Taylor.

Obstetrics and Surgery.—Mary I. C. Mackintosh, and Marian M. Reekie.

UNIVERSITY OF BIRMINGHAM.—At a congregation on Dec. 14th the following degrees were conferred:—

M.D.—H. P. Jameson.

M.B., Ch.B.—T. C. Dance, L. W. Downie, A. H. J. Jackson, T. W. Masters, M. K. Omar, Elizabeth S. Smith, and K. A. Thomas.

The Diploma in Dental Surgery has been awarded to Cyril Ford, C. E. Godfrey, E. S. Kench, W. R. E. Pickworth, and E. H. Sharp.

FINAL EXAMINATION FOR L.D.S.

C. Ford, C. E. Godfrey, E. S. Kench, W. R. E. Pickworth, and E. H. Sharp.

UNIVERSITY OF LEEDS.—At recent examinations the following candidates were successful:—

FINAL EXAMINATION FOR M.B. AND CH.B.

Part II.—T. G. Clarke, J. Donovan, L. B. Flather, H. T. Knowles, Margaret F. Robertson, and S. Simon.

Part III.—*T. L. Owen, *N. Pycroft, *J. O. Terry, S. G. Bedford, S. Bregman, A. Dalby, J. Donovan, Dorothy Halstead, C. R. Hiley, H. Hopkinson, W. E. L. Lawson, R. J. H. Raines, D. R. Riddell, Doreen M. Robertshaw, and L. Smith.

* Second-class Honours.

FINAL EXAMINATION FOR B.CH.D.

J. R. S. White.

D.P.H.

Fannie Hirst and W. A. D. Lawson.

D.P.M.

D. K. Bruce and D. Perk.

The West Riding panel practitioners' prize in medicine has been awarded to Trevor Lynn Owen.

ROYAL INSTITUTION.—On Tuesday, Jan. 29th, 1929, Prof. J. S. Huxley will give the first of six lectures on Evolution and the Problem of Species. The lectures on subsequent Thursdays include three by Sir William Bragg on the Early History of X Rays.

INCORPORATED ASSOCIATION OF HOSPITAL OFFICERS. Owing to the expiration of the lease of 28, Bedford-square, W.C., the offices of this organisation, including the Central Bureau of Hospital Information and the editorial office of the *Hospital Gazette*, are being transferred on Dec. 27th to Sentinel House, Southampton-row, London, W.C. 1. Tel.: Museum 8310.

ROYAL SANITARY INSTITUTE.—The following sessional meetings will be held at the Institute, 90, Buckingham Palace-road, London, S.W.: On Tuesday, Jan. 8th, 1929, at 5.30 P.M., Prof. Bostock Hill will open a discussion on Cleanliness: Is It the Basis of Health. On Friday, Feb. 1st, at 5 P.M., Major F. R. Humphreys will open a discussion on The Civilian Population and Chemical Warfare. Both of these sessional meetings will be held at the Institute, 90, Buckingham Palace-road, London, S.W.

DONATIONS AND BEQUESTS.—Miss Mary Caroline Hensley, Findon, Sussex, who left £12,130, besides other bequests, left the residue of her property to the London Hospital.—Mr. Sydney Frank Stott, of Woodleigh, Cheadle, Cheshire, left £1000 to Oldham Royal Infirmary and after various personal bequests the residue of the estate, amounting to over £10,000, also to the infirmary.—Mr. Thomas Kirk, of Oakles, Norton, Stockton-on-Tees, Durham, left £1500 to the Stockton and Thornby Hospital to endow a bed for the use, as far as possible, of workmen of the Carlton Iron Company, Ltd., and £250 to St. Dunstan's Home for Blind Soldiers.—Miss Mary Jane Kelle, Tulse Hill, London, S.W., left £12,600 for charities. The testatrix gave £1000 each to Guy's Hospital, the London Hospital, and St. Bartholomew's Hospital, and St. Dunstan's Hostel if her brother considers it is in need of funds, the National Lifeboat Institution, and four other institutions; £500 to the Royal Hospital for Incurables, Putney; and £250 each to the Association for Promoting the Welfare of the Blind, the Royal Eye Hospital, Southwark, the Royal Blind Pension Society, the Royal National Orthopædic Hospital, and two other institutions.—Mr. Alexander John Cameron, of Rosebowl, Perth, left £1000 to the County and City of Perth Royal Infirmary, and £500 to the Ross Memorial Hospital, Dingwall.

THE death is announced of Mr. J. Langford Moore, F.C.S., pharmacist to St. Bartholomew's Hospital. A memorial service was held in the Church of St. Bartholomew-the-Less on Dec. 19th.

A RAILWAY MEMORIAL HOSPITAL.—A hospital in memory of the old boys of the Southern Railway Servants' Orphanage at Woking is being erected in the grounds of the institution.

GRANTS FROM KING EDWARD'S FUND.—At a meeting of the general council of the Fund yesterday week it was decided to distribute £257,452, which includes ordinary maintenance grants, grants towards capital expenditure, and special pensions grants. Adding the final distribution out of the Wells legacies in May last, the grand total distributed to hospitals in 1928 is £288,202, besides £2000 to convalescent homes.

MEDICO-LEGAL SOCIETY.—The annual dinner of this Society was held at the Holborn Restaurant on Dec. 14th, with Sir William Willcox, the President, in the chair. In the absence of Earl Russell, the toast of "Medicine and Law" was proposed by Dr. F. G. Crookshank, who said that in listening to speakers at previous dinners he had sometimes doubted whether the toast was not "Medicine *versus* Law." It always interested him to hear lawyers referring to the British Medical Council and the General Medical Association, and he thought he might fairly retaliate by speaking of Sir Thomas Hughes, who was present that evening, as Chairman of the General Law Society or of the Bar Council Association. Sir Thomas Hughes, responding, repudiated the idea of any contest between medicine and law, which were sister professions, both concerned with doing their best for their fellow men. The doctor looked after their bodies and perhaps their souls, too, whilst the law looked after their character, property, and reputation. Medical victories had no shade of disappointment about them, since in medicine all were allied in fighting the common enemy. The lawyer, on the other hand, was always fighting someone else. Nevertheless, as Lord Bramwell had consolingly remarked: "In a long career at the Bar I have lost many cases I ought to have won, and won many cases I ought to have lost; and so on the whole justice is done." Dr. Walter Carr, President of the Medical Society of London, said it was the doctor's function to consider the well-being of his patients irrespective of laws and rules; whereas the lawyer had to put every possible obstacle in the way of arriving at a decision. Medical men would cheerfully sacrifice regulations to give their patient a chance of life, and perhaps they were too apt to follow the same course of action into spheres in which there was not the same urgency. Dr. Carr served with medical and legal colleagues on the committee of a charity and found that his medical friends were always ready to say: "Hang the standing orders." To which the lawyers replied: "You cannot hang a standing order; you can only suspend it; and you can only do that if due notice is given for one month and the decision is taken by two-thirds vote." The lawyer set great store by dates and would refuse a scholarship to a boy who by one day was born in the wrong year. Such a course seemed unjustifiable to medical men, who knew that the child's too early birth might well be due to the intervention of one of their colleagues anxious to have a night's rest. Mr. Justice Branson, proposing the toast of the "Medico-Legal Society," argued that there must always be a stile at which someone would stick. He held that there was much in common between the two professions, both of which were engaged in discovering the unknown from the known. Sir William Willcox, replying, said the Society was now in its twenty-sixth year and had gained 34 new members during the past 12 months. Eight meetings had been held and seven papers had been read, five by medical and two by legal members. The last had been given by Dr. Weatherly, now in his eightieth year, and had proved one of the best ever given to the Society. The discussions served a useful function in keeping members in touch with the modern developments of medicine and law, and this was very necessary since text-books were always several years out of date when they were published. Members also learned to know and appreciate one another, and doctors who belonged to the Society would find themselves well prepared for the ordeal of going into the witness-box. Lawyers required to be understood, and at a society like this the medical man would find himself beginning to understand them. Sir William concluded by referring to the valuable work done during the past year by the Hon. Treasurer (Sir Walter Schröder), the Hon. Secretaries (Sir Bernard Spilsbury and Mr. Ernest Goddard), and the Editors of the Society's *Transactions*. The toast of "The Guests" was proposed by Mr. Justice Humphreys and responded to by Sir Leonard Kerslaw and Sir Malcolm Delevingne.

RESEARCH ON ASTHMA.—The Halley Stewart Trust has made a grant of £2500 to the Asthma Research Council for the establishment of special clinics at Guy's Hospital and the Hospital for Sick Children, Great Ormond-street, for research into the cause and treatment of asthma and allied diseases.

MEMORIAL TO THE LATE MR. GEORGE HEATON.—A new balcony to one of the children's wards at the General Hospital, Birmingham, has been presented to this institution by 11 nieces and nephews of the late Mr. George Heaton, who was hon. surgeon to the hospital from 1894 to 1919. It will be remembered that the late Mr. Heaton, who always took a deep personal interest in the General Hospital, left £1000 on trust for prizes in connexion with the medical and nursing staff.

THE PENSIONS MINISTRY AND ARTIFICIAL LIMBS.—According to the report of the Ministry of Pensions for the year 1927–28, the Ministry still has under its care more than 36,000 persons with artificial limbs. During the year 6311 limbs were supplied, most of them renewals; more than 51,000 limbs were repaired. The number of artificial legs was 5205, of which 3404 were light metal legs.

PRESENTATIONS TO MEDICAL MEN.—Mr. W. F. Haslam was recently presented with a silver tray and a cheque on his retirement from active service in the Birmingham Medical School. He has held a succession of offices since his appointment to the staff of the General Hospital in 1882 and was Dean of the Faculty of Medicine in the University of Birmingham from 1919 until his resignation in May of this year. The silver tray presented to him was inscribed as follows:—

"Presented (with a cheque) to William Frederick Haslam, M.B., F.R.C.S., by Colleagues and Friends in the University of Birmingham on his retirement from his office of Dean of the Faculty of Medicine, a token of affection and gratitude for valuable services to the Medical and Dental Schools and the University during a period of 46 years, 1882–1928."

Dr. James Allan Gray, who has been medical officer of health for Leith and medical officer and lecturer on clinical medicine to the Leith Hospital, has completed 50 years of practice in connexion with the town. To mark the occasion his fellow practitioners recently presented Dr. Gray with a barograph and a cheque.

THE LATE MISS EGLANTYNE JEBB.—Miss Jebb, co-founder and honorary secretary of the Save the Children Fund, who died at Geneva last Monday at the age of 52, was the eldest daughter of the late Mr. and Mrs. Arthur Trevor Jebb, of Ellesmere, and niece of the late Sir Richard Jebb, Regius Professor of Greek in the University of Cambridge. After leaving Lady Margaret Hall, Oxford, she trained as an elementary school teacher, and subsequently became a member of the Borough of Cambridge Education Committee. Her greatest work, however, was directed to the relief of suffering arising from war and untoward economic conditions. During the second Balkan War she visited Macedonia on behalf of the Macedonian Relief Fund, and towards the end of the late war she became one of the founders of the Fight-the-Famine Council. It was in this organisation that the Save the Children Fund had its genesis—a movement which has been the means of disbursing over £4,000,000 for the relief of child suffering. She it was also who drafted the Declaration of Geneva, laying down the minimal obligations of society to the child, which was adopted by the Assembly of the League of Nations in 1924. With the work of the League she was actively associated as an assessor to the Committee for Child Protection.

Appointments.

DIBLE, J. H., M.B., Ch.B. Glasg., M.R.C.P. Lond., has been appointed to the George Holt Chair of Pathology, University of Liverpool.

YORKE, WARRINGTON, M.D., Ch.B. Liverp., to the Alfred Jones Chair of Tropical Medicine, University of Liverpool.

Vacancies.

For further information refer to the advertisement columns.

Ashton-under-Lyne, Lake Hospital and Darnton House.—Res. Asst. M.O. £150.
Barbad's General Hospital.—Jun. Res. S. £250.
Birmingham, Children's Hospital.—Cas. O. At rate of £250.
Blackburn C [illegible] Asst. M.O.H. £600.
Buxton, Der [illegible] H.P. At rate of £150.
Cambridge [illegible] *Laboratory.*—John Lucas Walker Studentship. £300.
Cancer Hospital, Fulham-road, S.W.—Radium Officer. £500. Also Asst. S.
Central London Ophthalmic Hospital, Judd-street, St. Pancras, W.C.—Sen. and Jun. H.S.'s. At rate of £120 and £100 respectively.
Central London, Throat, Nose and Ear Hospital.—Two Hon. Asst. Out-patient Registrars.
City of London Hospital for Diseases of the Heart, &c., Victoria Park, E.—H.P. At rate of £100.
Colchester, Essex County Hospital.—H.P. £150.
Croydon General Hospital.—Hon. Jun. Physician.
Derbyshire Education Committee.—Asst. School M.O. £600.
Dumfries, Crichton Royal Mental Hospital.—Clin. Pathologist. £400.
Freemasons Hospital and Nursing Home, 237, Fulham-road, Chelsea, S.W.—Res. M.O. At rate of £250.
Golden [illegible] *Hospital, W.*—Hon. Surgeon.
Hull, [illegible] —Res. M.O. £550.
Hull, [illegible] rate of £150.
Indian Medical Service.—Recruitment of European Officers.
Kingston and District Hospital.—Third Asst. Res. M.O. At rate of £250.
London Female Lock Hospital, 283, Harrow-road, W.—H.S. £150.
Manchester, Ancoats Hospital.—Asst. Surg. O. 10s. 6d. per attendance.
Manchester Northern Hospital for Women, &c., Park-place, Cheetham Hill-road.—Hon. Asst. Gynæcological Surgeon.
[illegible] *Infirmary.*—Medical Registrar. £150.
[illegible] *en-square, W.C.*—Res. M.O. £200
[illegible] *Hospital.*—Res. H.S. At rate of £150.
[illegible] *and East Cornwall Hospital.*—Res. Surg. O. Also H.S. At rate of £150 and £100 respectively.
Pontypridd Urban District Council.—M.O.H., &c. £800.
Princess Louise Kensington Hospital for Children, N. Kensington. Hon. Asst. P.
Royal Army Medical Corps.—Twenty-five Commissions.
Royal Free Hospital, Gray's Inn-road, W.C.—Asst. M.O. £500.
Salford, City Education Committee.—Asst. School M.O. £600.
St. Bartholomew's Hospital. Dental Surgeon.
St. Thomas's Hospital.—Obst. P. Also Obst. P. in Charge of Out-patients.
Stafford, Staffordshire General Infirmary.—H.S. and H.P. At rate of £200 and £150 respectively.
[illegible] H.P. and H.S. Each £175.
[illegible] M.O. LE.780.
[illegible] —Asst. M.O. £600.
[illegible] *Borough.*—Asst. Tuberculosis Officer, £500.
West London Hospital, Hammersmith-road, W.—Aural and Ophth. H.S. and Res. Asst. Cas. O. At rate of £100.
Willesden General Hospital, Harlesden-road, N.W.—Res. H.S. At rate of £100

The Chief Inspector of Factories announces a vacant appointment for a Certifying Factory Surgeon at Parbold (Lancs.).

A vacancy for a Medical Referee under the Workmen's Compensation Act for the Kilmarnock District (Sheriffdom of Ayr) and the [illegible] Applications should reach the P[illegible] Office, Whitehall, London, not [illegible]

Births, Marriages, and Deaths.

BIRTHS.

LISTER.—On Dec. 16th, at Devonshire-place, W., the wife of Arthur Reginald Lister, M.C., F.R.C.S., of Bootham, York, of a daughter.

MARRIAGES.

DAVENPORT—MAYFIELD.—On Dec. 6th, at St. Bartholomew the Great, E.C., Robert Cecil Davenport, F.R.C.S., to Helen Elizabeth Mayfield, M.R.C.S., L.R.C.P., eldest daughter of Mr. P. Mayfield and the late Mrs. Mayfield, of Hull.

DRU DRURY—HEWLINS CATLING.—On Dec. 12th, at St. Saviour's Church, Hampstead, Graham Dru Drury, M.R.C.S., L.R.C.P., to Helen Florence Hewlins Catling, youngest daughter of Mr. and Mrs. C. Brian Catling, of West Southbourne, Hants.

JOHNSON—PHILLIMORE.—On Dec. 8th, at All Souls', Hampstead, Dr. Bernard R. M. Johnson to Olive Mary, only daughter of William and Violet Phillimore, of Hampstead.

KINGSFORD—GILFILLAN.—On Dec. 13th, at Hampstead, Arthur Beresford Kingsford, M.D., to Esther Mary, sixth [illegible] of the late Rev. Thos. Gilfillan.

[illegible] On Dec. 15th, at All Souls, Langham-[illegible] he Rev. Alfred Pugh, assisted by the [illegible] Rector of the parish, Frederick Rogers [illegible] ger daughter of the late the Rev. T. E. Millington, M.A., and Mrs. Millington, of Bedford.

DEATHS.

CASS.—On Dec. 12th, suddenly, whilst out shooting near Bettws-y-Coed, North Wales, Edward Eden Cass, M.B., B.S., of Goole, Yorkshire.

COLEY.—On Dec. 13th, at Eldon-square, Newcastle-on-Tyne, Frederic Collins Coley, M.D., J.P., aged 73 years.

PRIESTLEY.—On Dec. 15th, Joseph Priestley, B.A., M.D., D.P.H., late M.O.H., Lambeth.

WHITE.—On Dec. 11th, at Albany-villas, Hove, Charles Percival White, M.B. Camb., M.V.O., aged 67.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

THE HEALTH OF CYPRUS.

THE island of Cyprus, situated in the Eastern Mediterranean, is about 140 miles in greatest length from east to west, and about 40 miles in greatest breadth from north to south. In 1878 the island passed under the administration of Great Britain, and, on the outbreak of war with Turkey in 1914, was annexed to the British Crown. In 1925, Letters Patent giving to Cyprus the status and name of a Colony, and constituting the office of Governor of the Colony in place of that of High Commissioner, were passed under the Great Seal.

According to the official report on the affairs of the island for the year 1927, recently issued through the Colonial Office, the estimated population on Dec. 31st was about 330,500, as against 310,709 shown in the census return taken in 1921. The total number of births registered in the island during the year was 8586, being 25·2 per 1000 of the population. The deaths numbered 5328, equivalent to 15·6 per 1000. The bulk of the inhabitants are of the Orthodox Greek-Christian faith, and belong to the Antecephalous Church of Cyprus. Of the remainder, some 65,000, or approximately one-fifth of the population, are Moslems. There is also an Armenian community, which tends steadily to increase, and a distinct though not numerous Latin colony. Except for the endemic prevalence of malarial fever, the climate is healthy and temperate, and with proper precautions there should be no difficulty in enjoying complete immunity from this disease. The heat and humidity in certain localities during the summer months impose a certain strain, but access to the hills is easily practicable within a very short distance. The climate during the winter might almost be described as ideal, combining as it does invigorating cold with clear sunshine. The continued dullness of more northern climes is seldom experienced, and a rainy day is invariably succeeded by a cloudless sky.

Epidemic Disease.

Public health in 1927 was satisfactory. Cyprus remained free from plague, typhus, and other virulent diseases common in the Near East. There was also no case of rabies during the year. The prevailing diseases, other than malaria and phthisis, were those of the digestive and respiratory systems, influenza, and dysentery. In one village there was a serious outbreak of enteric attributed to a contaminated water-supply, but the general incidence of this disease has of recent years been greatly diminished. There was an increase in the number of trachoma cases; but the increase would seem to be apparent rather than actual and due to the opening of special eye dispensaries. Phthisis, according to the official figures, would appear to have been slightly more prevalent than in 1926. Owing, however, to the extreme reluctance of private practitioners to report cases of phthisis, its actual incidence is hard to determine.

Malaria.

Although climatic conditions were more favourable in 1927, 500 more cases of malaria were treated than in the previous year. This may to a great extent be attributed to the opening of fresh dispensaries and to the growing readiness of the people to apply for medical aid. It is interesting to observe that whereas in 1913 out of 30,158 patients 24·1 per cent. had malaria, in 1927 out of 58,456 patients 16·19 per cent. had malaria; and that, whilst in 1913, 21·82 per cent. of 9178 children who were examined had enlarged spleens, in 1927 12,455 children were examined and the spleen-rate was 12·9 per cent. The antimalaria works carried out in 1927 include the cleaning of streams and drains, the draining and reclaiming of marshes, screening or filling in of wells, and the stocking of tanks and wells with fish. House-to-house inspections were made by the sanitary inspectors, large quantities of larvicide were used, and quinine was distributed free of charge to the population. Lectures, accompanied by lantern slides, were given in several places with a view to arousing the intelligent co-operation of the people in antimalaria work.

The infant mortality-rate in Cyprus is unduly high. This is attributed in part to malaria, in part to inherited syphilis, and in part to want of proper care and attention. An infant welfare centre was opened in Nicosia, and a nurse, specially trained in child welfare work, visited the centre twice weekly and gave advice and treatment. At the end of the year a venereal disease clinic was opened in Nicosia, and a specialist appointed.

Hospitals.

In the spring of 1927 Dr. A. E. Horn, C.M.G., visited Cyprus in order to report on the working of the medical department. During the year there were two hospitals and a sanatorium, maintained by the Government, in operation, together with four Government-aided hospitals, 27 rural dispensaries, and seven branch dispensaries. Each rural dispensary is the headquarters of a rural medical officer, who works among the village population. The duties of these officers are sanitary as well as medical, and they are engaged in particular in the campaign against malaria.

The total number of beds in the Government hospitals is 223, and almost 4000 patients were admitted during 1927, 721 surgical operations being performed. At the close of the year 130 inmates were detained at the lunatic asylum, as against 118 at its commencement; 19 persons were discharged as cured, and ten died; the number of new cases admitted was 41. The accommodation of the institution was ample. Lunacy in Cyprus is generally of a mild form, and restraint had to be resorted to in three cases only.

Leprosy.

The number of lepers admitted to the Leper Farm, which is run on the lines of a village, with its own church, mosque, and schools, was five, and the number of lepers detained at the close of the year amounted to 81. There were six deaths, all of which were advanced cases of the disease. Some of the inmates have been treated with gynocardate of soda, leprol, mogrol, and preparations of antimony, with some success. In nodular cases disappearance of the nodules and growth of the eyebrows has been noted. It is satisfactory to record that the disease has recurred in none of the five cases released on parole. The number of children at the end of the year in the home for the healthy children of lepers was nine, all of whom remained free from any sign of the disease.

Meteorology.

At Nicosia the absolute mean temperature for 1927 was 66·5° F.; the mean maximum was 79·2° F., and the mean minimum 55·9° F. Rainfall for the last ten years has averaged 20·33 inches per annum; the mean for 1927 was 16·81 inches, as compared with 28·19 inches for 1926. Twenty-two earthquake shocks were recorded during 1927; they were all felt in Limasol. Two of the shocks were classified as severe, and occasioned a certain amount of damage to buildings. There are numerous resorts in the hills at altitudes varying from 6000 to 2000 feet, such as Mount Troödos or Kantara, where the summer season, lasting from June to the end of September, can be passed in eminently healthy surroundings and without discomfort or inconvenience. On Troödos during the 1927 season the maximum shade temperature was 91° F. and the minimum 48° F.

THE SEASONAL INCIDENCE OF THE PLAGUE.

IN his scholarly little handbook, "The Boar's Head Tavern in Eastcheap,"[1] Dr. Kenneth Rogers gives (p. 49) some interesting figures of the monthly incidence of the last five epidemics of plague. With the help of the Rev. H. J. Fynes-Clinton, who contributes a foreword to the book, he has investigated the old registers of the city parishes of St. Michael, Crooked Lane, and St. Magnus, and has constructed a table of great epidemiological interest. The carrier of the disease, the rat flea, was especially abundant in the summer months, and the mortality as shown by the burial lists, from being negligible in June, showed a sharp rise culminating in September and sinking again almost to nothing in December. The average September figure for the two parishes in the last five plague years was over 72; the figures for the winter months were under four. Another unexpected result is that the final outburst, that of 1665, was by no means the deadliest. The September burials were 69 in that year, but in 1603 they were 89, and in 1563 they were 92. Attention has probably been focused on the "Great Plague" partly because it was the last and partly because of the unique description of it written by Pepys in his diary.

THE CONTINENTAL ANGLO-AMERICAN MEDICAL DIRECTORY.

WE have received from Dr. B. Sherwood-Dunn, hon. secretary and treasurer of the Continental Anglo-American Medical Society, a copy of a revised directory. This list of Anglo-American doctors practising in continental Europe or Northern Africa was first issued in 1889 and was kept going year by year by Dr. Thomas Linn, who died last July. The list is intended to serve as a bond of union between practitioners, and should help to circumvent the boycott of the English-speaking doctor in the foreign resort by hotel managers and others who naturally prefer to recommend home produce. The list will be supplied free of charge to anyone who applies to Dr. Sherwood-Dunn at 54, Boulevard Victor-Hugo, Nice, A.-M., France.

[1] The Hospital Association, Ltd., 37, Maiden-lane, Covent Garden, W.C. 1928. Pp. 55. 4s. 6d.

"BAY MOUNT," PAIGNTON.

Dr. Stanford Park's sixth annual report covers the experience of the year 1927 at the home for alcoholism, drug habits, and neurasthenia, of which he is resident medical superintendent. During the year 43 new patients were admitted for treatment; 6 patients remained over from 1926. Of the total number 36 were males and 13 females. There were 23 cases of alcoholism, 4 cases of alcoholism plus marked neurasthenia, 14 drug cases (5 of which also took alcohol to excess), and two cases of neurasthenia without any history of drink or drugs. No case of delirium tremens occurred, but there were two severe cases of alcoholic neuritis, and two of cirrhosis of the liver. The results obtained were good and at times even remarkable. Dr. Park remarks that there is no apparent reason why practically all patients, who are not mentally affected, should not be cured by the treatment provided. There is sometimes the difficulty that patients at the end of three or four weeks' treatment feel so well as to think they are cured, and it may be difficult to persuade them to complete their cure. The unwilling patient remains the most difficult problem. Dr. Park distinguishes three types: (1) the man who denies that he drinks to excess, or that he drinks at all; (2) the man who says he can stop when he likes, and that treatment is unnecessary; (3) the man who frankly says he likes drink and won't give it up. If they are persuaded to submit to treatment they always require much coaxing and exhortation. Nevertheless an apparently hopeless case is sometimes cured. Occupation with work or play is regarded as most important, and patients are urged to occupy their time, while will-power and self-confidence are built up by appropriate methods. Dr. Park concludes his report with a plea to physicians and patients' relations to send cases early. To delay, in the hope that the patient will improve or be cured at home, is mistaken kindness.

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THE MODIFICATION OF THE ŒSTRAL CYCLE IN RATS.

IT has been stated (Lyman, *Amer. Jour. Phys.*, 1928, lxxxv., 414) that adrenalectomy brings about the suppression of the œstral cycle in rats. In a series of experiments[1] made by Del Castillo on female rats, the extirpation of the adrenals is shown to have no greater effect upon the œstral cycles of the animals than does a similar operation in which these glands are left intact. None of the animals died as a result of the operation. The onset of puberty, when young rats are adrenalectomised, is not affected. These results are in agreement with those of Zondek (*Klin. Woch.*, 1927, vi., 685) on white mice, and it is probable that Lyman's results are to be attributed to the results of operation—14 out of 17 animals died within a period of 27 days following operation.

In two brief communications which appear in the same journal (pp. 1404, 1405) Del Castillo shows that removal of the spleen and pineal body respectively produces no effect other than that attributed to operative trauma; and he also confirms the observations of Buschke, Zondek, and Berman (*Klin. Woch.*, 1927, vi., 683) that the appearance of œstrus is temporarily inhibited by subcutaneous administration of thallium. Sodium fluoride and irradiation with ultra-violet light produce a similar result; but in these experiments the cycles did not reappear and the rats remained in a condition of permanent diœstrus.

THE address of the North Kensington Welfare Centre, on whose annual report we commented last week is 12, Telford-road, Ladbroke-grove, London, W. 10.

Corrigendum.—In Mr. W. H. Ogilvie's article on "A Pneumatic Bone Operating Set" (THE LANCET, Dec. 8th, p. 1177), the pressure in the cylinders of compressed air should read 120 *atmospheres*, not pounds.

[1] Le cycle œstral du rat normal et décapsulé. By E.-B. Del Castillo. Compt. rend. de la Soc. de Biol., 1928, xcix., 1403.

THE KING'S ILLNESS.

OFFICIAL BULLETINS.

(*Continued from p. 1276.*)

THE following is the text of the official bulletins which have been issued during the King's illness by Sir Stanley Hewett and Lord Dawson.

THURSDAY, DEC. 13TH. 10.45 A.M.

The King has had some sleep. The local condition is satisfactory. The weakness and toxæmia are considerable, but the pulse is steady and His Majesty is not losing ground. (Signed also by Sir Hugh Rigby.)

8.15 P.M. Though the King is still suffering from exhaustion, there is a slight improvement in His Majesty's condition this evening. The local condition remains satisfactory. (Signed also by Sir Hugh Rigby.)

FRIDAY, DEC. 14TH. 10.30 A.M.

The slight improvement in the King's condition noted last evening is maintained. Any progress must be slow and difficult. (Signed also by Sir Hugh Rigby.)

8.15 P.M. The King has had a somewhat disturbed day, and the general condition is not quite so satisfactory. The pulse, however, remains steady. (Signed also by Sir Hugh Rigby.)

SATURDAY, DEC. 15TH. 11 A.M.

The King has had several hours' sleep. The local condition is so far satisfactory. There is no increase in the exhaustion and the pulse remains steady. (Signed also by Sir Hugh Rigby.)

7.20 P.M. His Majesty has had a quiet day, with some sleep. Though the pulse remains steady and the fever is now moderate, the exhaustion persists. It had been decided to employ ray therapy as part of the treatment. (Signed also by Sir Hugh Rigby, Dr. Robert Stanton Woods, and Dr. Frank Howitt.)

SUNDAY, DEC. 16TH. 11 A.M.

In spite of a restless night His Majesty's general condition has slightly improved. (Signed also by Sir Hugh Rigby.)

8 P.M. The King has had a quiet day and the improvement in His Majesty's condition noted this morning has been maintained. (Signed also by Sir Hugh Rigby.)

MONDAY, DEC. 17TH 10.45 A.M.

The King has had a fair night with some natural sleep towards morning. The slight improvement in His Majesty's condition noted yesterday continues. (Signed also by Sir Hugh Rigby.)

8.15 P.M. The King has this afternoon been somewhat restless, and the progress recently noted has not been continued during the last few hours. (Signed also by Sir Hugh Rigby.)

TUESDAY, DEC. 18TH. 11 A.M.

In spite of the King having passed a disturbed night there is a slight improvement in both the general and local conditions. (Signed also by Sir Hugh Rigby.)

8.10 P.M. The King has passed a quiet day, and the progress noted this morning has continued. (Signed also by Sir Hugh Rigby.)

WEDNESDAY, DEC. 19TH. 11 A.M.

The King has had a restful night. The slight improvement noted yesterday continues. (Signed also by Sir Hugh Rigby.)

WORK OF THE MIDDLESEX HOSPITAL.—The report for the year 1927 shows that the average weekly cost of each in-patient was £4 16s. 8d., as compared with £5 0s. 1d. for the preceding year. The fall is due mainly to the increased bed occupancy and to the greater number of patients treated owing to the annexe being in use for the whole year. There has again been a heavy increase in out-patients—40,018, against 45,457. The new cases are 41 per cent., and the attendances 50 per cent. greater than in 1922. Attention is directed to the importance of endowing the professorial chairs in the University of London attached to the hospital's medical school. Of the seven chairs four are still unendowed

An Address
ON
PURPURA.

Delivered before the Monklands Medical Society on Oct. 23rd

BY WALTER K. HUNTER, M.D., D.Sc. GLASG.,
MUIRHEAD PROFESSOR OF MEDICINE IN THE UNIVERSITY OF GLASGOW.

PURPURA may be briefly described as a condition in which there are spontaneous extravasations of blood into the skin or mucous membranes. The purpuric spot, a dark red macule varying in size from 1 to 3 mm. in diameter, is perhaps the most characteristic manifestation of these hæmorrhages, and so has given the name to the hæmorrhagic tendency. But the hæmorrhages may also be pin-point in size (petechiæ), or take the form of larger extravasations, called ecchymoses. Moreover, the bleeding need not be confined to the skin and mucous membranes, for it may be subcutaneous, into the interstitial tissue of the viscera, from serous surfaces, or into the retina or globe of the eye. The amount of blood effused varies greatly in the different cases and in the same case from time to time. Sometimes the effusion consists of blood plasma only, producing urticaria in the cutis, angioneurotic œdema in subcutaneous tissues, or "arthritis" in a joint. Sometimes the urticarial and purpuric eruptions are present at the same time, or one may alternate with the other. The essential fault seems to be in the capillary wall which, for the time being, allows undue transudation of blood or certain of its component parts. Plasma only may be transuded, as in urticaria and the effusion into joints; there may be a diapedesis of red corpuscles, as in the purpuric spot; or there may be effusion of whole blood (plasma and corpuscles) as in the ecchymoses and certain other hæmorrhages. In purpura injury to the outer layer of the skin is rare and hence no blood escapes from that surface, but in purpura of mucous surfaces, although in uncomplicated cases there is no ulceration, the blood seems to escape between the cells of the intact mucous membrane, and much may be lost. This escape of blood from mucous membrane is analogous to the escape of serous fluid in hay-fever, asthma, and other vasomotor disturbances.

CLASSIFICATIONS OF PURPURA.

These various manifestations of purpura, occurring by themselves or in various combinations, have naturally produced a dissimilar clinical picture in different cases; hence arose the four types of purpura described in the older text-books. These are:—

(1) *Purpura simplex*, in which the lesion is confined mostly to the skin and consists mainly of purpuric spots which come out in crops on the extensor surfaces of the limbs.

(2) *Purpura rheumatica* (Schönlein's disease), where there is pain and effusion in the joints, in addition to various skin disturbances, such as purpuric spots, urticaria, erythema (both diffuse and nodular), and ecchymoses.

(3) *Henoch's purpura*, with serous or hæmorrhagic effusion into the intestine, giving rise to intestinal colic, vomiting, and diarrhœa.

(4) *Purpura hæmorrhagica*, where bleeding from mucous surfaces is the outstanding feature.

Nevertheless, these various appearances are but different symptoms produced by the fault in the capillary wall, and the classification, while it may have been convenient, is at times confusing, for the types tend to overlap each other, and an individual case may have the features of two or more different types.

More recently an attempt has been made to classify the purpuras from the point of view of the examination of the blood. In all cases of purpura there tends to be anæmia of the secondary type, and its degree of severity will depend on (*a*) the amount of blood lost, and (*b*) the capacity of the blood-forming organs to make good the loss. Along with the deficiency in red cells and hæmoglobin there is frequently a degree of leucocytosis, affecting chiefly the polymorphonuclear leucocytes, although in some cases there is a persistent leucopenia. This variation in the number of leucocytes may again depend on the activity of the bone-marrow, but it may also be influenced by an infective agent, either the causal organism producing the purpura or a secondary infection. The anæmia of purpura is therefore in no way distinctive. There are, however, certain features of the blood which are supposed to be more or less characteristic of purpura. (1) In many cases there is a diminution in the number of platelets from, say, 350,000 to 5000 or less. The platelets, too, may be larger than normal and altered in shape. (2) The bleeding time may be considerably increased. (3) Though coagulation time is normal, the clot when formed does not retract normally. (4) The tourniquet test is positive—i.e., when the arm is constricted for two to five minutes a crop of petechial spots appears distal to the pressure area. These four signs are not met with in all cases of purpura, and it has been maintained that they are positive only in purpura hæmorrhagica. More recently, therefore, the purpuras have been divided into two types which are claimed to be essentially different. The first consists of purpura hæmorrhagica (sometimes called essential thrombopenic purpura, and also Werlhof's disease), and the second of Schönlein-Henoch purpura (also spoken of as anaphylactoid purpura), which includes simple purpura, purpura rheumatica, and Henoch's purpura. In the former group (Werlhof's disease) there is bleeding from mucous membranes and purpuric spots and ecchymoses on the skin, but none of the other skin manifestations—such as urticaria, œdema, or erythema—and no arthritis. There is also little tendency to bleeding into solid organs, and rarely nephritis. There is, however, thrombopenia, increase in bleeding time, and a clot which does not contract. In the second form (anaphylactoid purpura) the bleeding time, retraction of clot, and number of platelets are normal, and there may be any of the symptoms characteristic of purpura rheumatica and Henoch's purpura. In the former group fever is said never to occur, whereas it is not uncommon in anaphylactoid purpura.

From the descriptive point of view this classification may be more useful than the older one; but I find it difficult to believe that in essential thrombopenia and anaphylactoid purpura we are dealing with two different clinical entities or, indeed, that there is any essential difference between them. In drawing this distinction the chief emphasis has been laid on the presence or absence of thrombopenia. It is true that there is a diminution in the platelet count in most of the more severe cases of purpura hæmorrhagica, at least during the active phase of the disease. But the platelet count is also reduced in many of the more severe cases of anaphylactoid purpura, and it has not been satisfactorily demonstrated that thrombopenia always precedes the purpura, or that a platelet rise is a precursor of the arrest of hæmorrhage. Indeed, the thrombopenia is perhaps more probably a sequel of the bleeding than its cause, or it may be that the factor (toxin?) which produces the bleeding at the same time determines the thrombopenia. We do not understand the functions of the blood-platelets, much less the significance of their variations in number. They are presumably produced in the bone-marrow, and their number may vary with its activity and virility. We know that their count may alter with great rapidity within the course of a few hours without any recognisable cause. By the injection of anti-platelet serum they have been caused to disappear from the circulation without ill-effect to the patient and without the appearance of purpura. In hæmophilia, when

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THE MODIFICATION OF THE ŒSTRAL CYCLE IN RATS.

IT has been stated (Lyman, *Amer. Jour. Phys.*, 1928, lxxxv., 414) that adrenalectomy brings about the suppression of the œstral cycle in rats. In a series of experiments[1] made by Del Castillo on female rats, the extirpation of the adrenals is shown to have no greater effect upon the œstral cycles of the animals than does a similar operation in which these glands are left intact. None of the animals died as a result of the operation. The onset of puberty, when young rats are adrenalectomised, is not affected. These results are in agreement with those of Zondek (*Klin. Woch.*, 1927, vi., 685) on white mice, and it is probable that Lyman's results are to be attributed to the results of operation—14 out of 17 animals died within a period of 27 days following operation.

In two brief communications which appear in the same journal (pp. 1404, 1405) Del Castillo shows that removal of the spleen and pineal body respectively produces no effect other than that attributed to operative trauma; and he also confirms the observations of Buschke, Zondek, and Berman (*Klin. Woch.*, 1927, vi., 683) that the appearance of œstrus is temporarily inhibited by subcutaneous administration of thallium. Sodium fluoride and irradiation with ultra-violet light produce a similar result; but in these experiments the cycles did not reappear and the rats remained in a condition of permanent diœstrus.

THE address of the North Kensington Welfare Centre, on whose annual report we commented last week is 12, Telford-road, Ladbroke-grove, London, W. 10.

Corrigendum.—In Mr. W. H. Ogilvie's article on "A Pneumatic Bone Operating Set" (THE LANCET, Dec. 8th, p. 1177), the pressure in the cylinders of compressed air should read 120 *atmospheres*, not pounds.

[1] Le cycle œstral du rat normal et décapsulé. By E.-B Del Castillo. Compt. rend. de la Soc. de Biol., 1928, xcix., 1403.

THE KING'S ILLNESS.

OFFICIAL BULLETINS.

(*Continued from p. 1276.*)

THE following is the text of the official bulletins which have been issued during the King's illness by Sir Stanley Hewett and Lord Dawson.

THURSDAY, DEC. 13TH. 10.45 A.M.

The King has had some sleep. The local condition is satisfactory. The weakness and toxæmia are considerable, but the pulse is steady and His Majesty is not losing ground. (Signed also by Sir Hugh Rigby.)

8.15 P.M. Though the King is still suffering from exhaustion, there is a slight improvement in His Majesty's condition this evening. The local condition remains satisfactory. (Signed also by Sir Hugh Rigby.)

FRIDAY, DEC. 14TH. 10.30 A.M.

The slight improvement in the King's condition noted last evening is maintained. Any progress must be slow and difficult. (Signed also by Sir Hugh Rigby.)

8.15 P.M. The King has had a somewhat disturbed day, and the general condition is not quite so satisfactory. The pulse, however, remains steady. (Signed also by Sir Hugh Rigby.)

SATURDAY, DEC. 15TH. 11 A.M.

The King has had several hours' sleep. The local condition is so far satisfactory. There is no increase in the exhaustion and the pulse remains steady. (Signed also by Sir Hugh Rigby.)

7.20 P.M. His Majesty has had a quiet day, with some sleep. Though the pulse remains steady and the fever is now moderate, the exhaustion persists. It had been decided to employ ray therapy as part of the treatment. (Signed also by Sir Hugh Rigby, Dr. Robert Stanton Woods, and Dr. Frank Howitt.)

SUNDAY, DEC. 16TH. 11 A.M.

In spite of a restless night His Majesty's general condition has slightly improved. (Signed also by Sir Hugh Rigby.)

8 P.M. The King has had a quiet day and the improvement in His Majesty's condition noted this morning has been maintained. (Signed also by Sir Hugh Rigby.)

MONDAY, DEC. 17TH 10.45 A.M.

The King has had a fair night with some natural sleep towards morning. The slight improvement in His Majesty's condition noted yesterday continues. (Signed also by Sir Hugh Rigby.)

8.15 P.M. The King has this afternoon been somewhat restless, and the progress recently noted has not been continued during the last few hours. (Signed also by Sir Hugh Rigby.)

TUESDAY, DEC. 18TH. 11 A.M.

In spite of the King having passed a disturbed night there is a slight improvement in both the general and local conditions. (Signed also by Sir Hugh Rigby.)

8.10 P.M. The King has passed a quiet day, and the progress noted this morning has continued. (Signed also by Sir Hugh Rigby.)

WEDNESDAY, DEC. 19TH. 11 A.M.

The King has had a restful night. The slight improvement noted yesterday continues. (Signed also by Sir Hugh Rigby.)

WORK OF THE MIDDLESEX HOSPITAL.—The report for the year 1927 shows that the average weekly cost of each in-patient was £4 16s. 8d., as compared with £5 0s. 1d. for the preceding year. The fall is due mainly to the increased bed occupancy and to the greater number of patients treated owing to the annexe being in use for the whole year. There has again been a heavy increase in out-patients—19,018, against 45,457. The new cases are 41 per cent., and the attendances 50 per cent. greater than in 1922. Attention is directed to the importance of endowing the professorial chairs in the University of London attached to the hospital's medical school. Of the seven chairs four are still unendowed

An Address
ON
PURPURA.

Delivered before the Monklands Medical Society on Oct. 23rd

BY WALTER K. HUNTER, M.D., D.Sc. GLASG.,
MUIRHEAD PROFESSOR OF MEDICINE IN THE UNIVERSITY OF GLASGOW.

PURPURA may be briefly described as a condition in which there are spontaneous extravasations of blood into the skin or mucous membranes. The purpuric spot, a dark red macule varying in size from 1 to 3 mm. in diameter, is perhaps the most characteristic manifestation of these hæmorrhages, and so has given the name to the hæmorrhagic tendency. But the hæmorrhages may also be pin-point in size (petechiæ), or take the form of larger extravasations, called ecchymoses. Moreover, the bleeding need not be confined to the skin and mucous membranes, for it may be subcutaneous, into the interstitial tissue of the viscera, from serous surfaces, or into the retina or globe of the eye. The amount of blood effused varies greatly in the different cases and in the same case from time to time. Sometimes the effusion consists of blood plasma only, producing urticaria in the cutis, angioneurotic œdema in subcutaneous tissues, or "arthritis" in a joint. Sometimes the urticarial and purpuric eruptions are present at the same time, or one may alternate with the other. The essential fault seems to be in the capillary wall which, for the time being, allows undue transudation of blood or certain of its component parts. Plasma only may be transuded, as in urticaria and the effusion into joints; there may be a diapedesis of red corpuscles, as in the purpuric spot; or there may be effusion of whole blood (plasma and corpuscles) as in the ecchymoses and certain other hæmorrhages. In purpura injury to the outer layer of the skin is rare and hence no blood escapes from that surface, but in purpura of mucous surfaces, although in uncomplicated cases there is no ulceration, the blood seems to escape between the cells of the intact mucous membrane, and much may be lost. This escape of blood from mucous membrane is analogous to the escape of serous fluid in hay-fever, asthma, and other vasomotor disturbances.

CLASSIFICATIONS OF PURPURA.

These various manifestations of purpura, occurring by themselves or in various combinations, have naturally produced a dissimilar clinical picture in different cases; hence arose the four types of purpura described in the older text-books. These are:—

(1) *Purpura simplex*, in which the lesion is confined mostly to the skin and consists mainly of purpuric spots which come out in crops on the extensor surfaces of the limbs.

(2) *Purpura rheumatica* (Schönlein's disease), where there is pain and effusion in the joints, in addition to various skin disturbances, such as purpuric spots, urticaria, erythema (both diffuse and nodular), and ecchymoses.

(3) *Henoch's purpura*, with serous or hæmorrhagic effusion into the intestine, giving rise to intestinal colic, vomiting, and diarrhœa.

(4) *Purpura hæmorrhagica*, where bleeding from mucous surfaces is the outstanding feature.

Nevertheless, these various appearances are but different symptoms produced by the fault in the capillary wall, and the classification, while it may have been convenient, is at times confusing, for the symptoms tend to overlap each other, and an individual may have the features of two or more different types.

Recently an attempt has been made to classify purpura from the point of view of the examination of the blood. In all cases of purpura there tends to be anæmia of the secondary type, and its degree of severity will depend on (*a*) the amount of blood lost, and (*b*) the capacity of the blood-forming organs to make good the loss. Along with the deficiency in red cells and hæmoglobin there is frequently a degree of leucocytosis, affecting chiefly the polymorphonuclear leucocytes, although in some cases there is a persistent leucopenia. This variation in the number of leucocytes may again depend on the activity of the bone-marrow, but it may also be influenced by an infective agent, either the causal organism producing the purpura or a secondary infection. The anæmia of purpura is therefore in no way distinctive. There are, however, certain features of the blood which are supposed to be more or less characteristic of purpura. (1) In many cases there is a diminution in the number of platelets from, say, 350,000 to 5000 or less. The platelets, too, may be larger than normal and altered in shape. (2) The bleeding time may be considerably increased. (3) Though coagulation time is normal, the clot when formed does not retract normally. (4) The tourniquet test is positive—i.e., when the arm is constricted for two to five minutes a crop of petechial spots appears distal to the pressure area. These four signs are not met with in all cases of purpura, and it has been maintained that they are positive only in purpura hæmorrhagica. More recently, therefore, the purpuras have been divided into two types which are claimed to be essentially different. The first consists of purpura hæmorrhagica (sometimes called essential thrombopenic purpura, and also Werlhof's disease), and the second of Schönlein-Henoch purpura (also spoken of as anaphylactoid purpura), which includes simple purpura, purpura rheumatica, and Henoch's purpura. In the former group (Werlhof's disease) there is bleeding from mucous membranes and purpuric spots and ecchymoses on the skin, but none of the other skin manifestations—such as urticaria, œdema, or erythema—and no arthritis. There is also little tendency to bleeding into solid organs, and rarely nephritis. There is, however, thrombopenia, increase in bleeding time, and a clot which does not contract. In the second form (anaphylactoid purpura) the bleeding time, retraction of clot, and number of platelets are normal, and there may be any of the symptoms characteristic of purpura rheumatica and Henoch's purpura. In the former group fever is said never to occur, whereas it is not uncommon in anaphylactoid purpura.

From the descriptive point of view this classification may be more useful than the older one; but I find it difficult to believe that in essential thrombopenia and anaphylactoid purpura we are dealing with two different clinical entities or, indeed, that there is any essential difference between them. In drawing this distinction the chief emphasis has been laid on the presence or absence of thrombopenia. It is true that there is a diminution in the platelet count in most of the more severe cases of purpura hæmorrhagica, at least during the active phase of the disease. But the platelet count is also reduced in many of the more severe cases of anaphylactoid purpura, and it has not been satisfactorily demonstrated that thrombopenia always precedes the purpura, or that a platelet rise is a precursor of the arrest of hæmorrhage. Indeed, the thrombopenia is perhaps more probably a sequel of the bleeding than its cause, or it may be that the factor (toxin?) which produces the bleeding at the same time determines the thrombopenia. We do not understand the functions of the blood-platelets, much less the significance of their variations in number. They are presumably produced in the bone-marrow, and their number may vary with its activity and virility. We know that their count may alter with great rapidity within the course of a few hours without any recognisable cause. By the injection of anti-platelet serum they have been caused to disappear from the circulation without ill-effect to the patient and without the appearance of purpura. In hæmophilia, when

spontaneous hæmorrhage is the outstanding symptom, there is no thrombopenia.

The increase of the bleeding time, which is also said to be characteristic of purpura hæmorrhagica, is no doubt met with in certain cases of purpura where bleeding has been going on, and in most cases it varies directly with the thrombopenia. It seems, however, to vary with the activity of the disease, as well as at different parts of the body when tested at the same time. It is therefore somewhat inconstant, even in purpura hæmorrhagica. Before we admit the significance of thrombopenia and bleeding time we must know more about them, not only in the different types of purpura, but also during different phases of the illness in individual cases. The same applies to retraction of the clot and the tourniquet test (which, by the way, may produce urticaria rather than petechiæ).

SYMPTOMATOLOGY.

Purpura tends to be intermittent, each attack lasting from one or two days to five or six weeks, with intervals of variable duration when the patient seems in good health. It may also take a chronic form, fresh manifestations of the disease appearing every few days; this may go on for years. On the other hand, it may be very acute, with one or two attacks within a short period and great effusion of blood, ending fatally in the course of a few hours to one or two weeks. In contrast to this is *simple purpura*, a mild disturbance with purpuric spots coming out in crops over a period of three to six weeks, and often with no recurrence. The bleeding from mucous membranes most often takes the form of an epistaxis, and then, in order of frequency, comes bleeding from gums, urinary tract, uterus, stomach, and intestine. Hæmoptysis is rare. There may be bleeding from only one mucous surface, or several may be involved at the same time; recurrences may affect the same mucous membrane each time, although not invariably.

Before an attack there is frequently some slight constitutional disturbance, such as headache, malaise, nausea, vomiting, pains in the limbs, and sometimes slight fever. These symptoms vary considerably in different cases. The blood pressure is usually low in purpura.

Most cases ultimately recover (the mortality has been put down at 15 per cent.), but the more chronic cases may suffer a great deal of debility and ill-health. Certain complications may supervene, such as nephritis, endocarditis, cerebral hæmorrhage and, in Henoch's type of the disease, ulceration of the stomach or intestine. The nephritis may be acute, with dropsy, or it may be chronic, and it seems to be most often met with in the Schönlein-Henoch type of purpura. The intracranial hæmorrhage is usually meningeal in origin, and may be subpial, subdural, or pachymeningitic. Endocarditis seems to be most common in purpura with arthritis. Piney[1] suggests that endocarditis lenta is nearly related to purpura, and maintains that the skin manifestations and hæmaturia in the former are not embolic, but have a similar origin to those symptoms in purpura.

DIAGNOSIS.

The purpuric rash is very distinctive and will at once suggest the disease, but in its absence it is easy to miss the significance of the arthritis of Schönlein's type, the abdominal symptoms of Henoch's type, or hæmorrhage from a single mucous surface. The arthritis of purpura has often been mistaken for, and treated as, "rheumatism," and the abdominal colic may closely simulate embolism or thrombosis of the mesenteric artery, or some other form of the "acute abdomen." When there is bleeding from one mucous membrane only, the difficulty of diagnosis may be very real. Kidd[2] has recently recorded 24 cases of hæmaturia where he has been able to demonstrate by cystoscopic or direct examination numerous petechiæ on the mucous surface of the bladder or in the pelvis of the kidney. Some of these patients had purpuric spots on the skin, some had arthritis, and some bleeding from another mucous membrane. In such cases the nature of the hæmaturia is less difficult to appreciate, but in the absence of those other signs of purpura, or with an associated nephritis, as there was in one of his cases, the cause of the blood in the urine may remain obscure, at least without the aid of the cystoscope. The rather profuse and continuous hæmaturia which is sometimes met with in chronic nephritis, especially in children, is possibly sometimes purpuric, and a number of cases with too profuse bleeding at the menstrual periods are without doubt cases of purpura. Possibly so-called gastrostaxis has a similar explanation. Purpura is not likely to be mistaken for hæmophilia, for the history of the two conditions is very different; but less severe cases of scurvy, especially if the gums are not affected, may have a rash very like that of purpura. In scurvy, however, the purpuric spots are usually confined to the hair follicles, and situated on the outer aspects of the legs and thighs. This gives a characteristic rough surface, which is felt on passing the hand over the eruption, and which is not present in purpura.

PATHOGENESIS.

The chief lesion in purpura is an undue permeability, for the time being, of the capillary wall, which permits the transudation of red corpuscles, plasma, or whole blood. The questions are: What causes this state of the capillary? and how does it cause it? We know that certain manifestations of purpura can be produced experimentally, and in some people much more easily than in others. In so-called secondary purpura the purpura macula can be induced by injecting cobra venom. It sometimes follows the administration of such drugs as quinine and iodide of potassium. It may also occur in cerebro-spinal fever, small-pox, or scarlet fever, and it is the characteristic rash of typhus fever. The urticarial rash, too, can be induced by a variety of irritants, such as the bite of certain insects, the sting of the nettle, and even mechanical irritation, as in dermography. It is a symptom in serum disease. Indeed, urticaria is one of the commonest appearances in the allergic state, and the existence of an undue sensitisation or allergy in the urticarial subject seems to have been established. It might therefore be argued that in certain cases of purpura this undue sensitisation of the capillary wall determines an abnormal reaction to specific agents, and that whether it is inherited or acquired it constitutes the *predisposing* factor in the disease. In other diseases there are "bad antitoxin formers," and it may be that in purpura we have what has been called an immunological defect.

Of the exciting cause we have little definite information but, as in asthma, it is probably different in different cases, and perhaps different in the same case at different times. There may be some fault in the digestive tract allowing foreign proteins in an unaltered state to enter the blood stream. Or the cause may be a physical agent, such as trauma, light, or heat, which, acting on a hypersensitive tissue, liberates a histamine-like body. Kidd has drawn attention to the frequency of a local focus of infection in his series, and he isolated from some of his cases a streptococcus in pure culture. Sometimes sore-throat was complained of before the onset of purpura; sometimes it was tonsillectomy or the extraction of septic teeth that preceded the attack. He suggests that in these patients the purpura was due to a streptococcal infection of throat, teeth, or perhaps bowel, producing possibly a mild toxæmia rather than a septicæmia.

It seems to be taken for granted by certain writers that the deficiency of platelets is the cause of the bleeding. They say that with a platelet count above 35,000 or 40,000 bleeding becomes completely arrested and that purpura cannot be produced experimentally

[1] Recent Advances in Hæmatology, 1927, p. 175.
[2] Kidd: Proc. Roy. Soc. Med., 1928, vol. xxi., No. 6.

unless there is a lower figure. With this I cannot agree. I have had under my care patients with a much higher count in whom bleeding was active, and other cases with a lower count and no signs of the disease. At the present time it seems more judicial to view the platelet count in much the same way as we do the leucocyte count. Leucopenia may be a symptom of disease but not its cause, and the same may apply to thrombopenia in purpura.

TREATMENT.

In the absence of any proper understanding of the ætiology of purpura, treatment must be more or less empirical. It is reasonable, however, to treat all septic foci, such as septic teeth and tonsils. Drugs seem to have little real effect on the disease, although calcium salts are usually prescribed with the idea that they lessen transudation through the vessel wall. Horse serum is known to check bleeding in many cases, and it is given in 25 c.cm. doses every alternate day for three doses in all. In recurring cases the same dose may be given three times a week every two or three months. This serum has most often been given in the form of antistreptococcic serum, and it seems to be as efficient when administered by the mouth as subcutaneously. If given subcutaneously, subsequent doses may produce serum disease. Kidd has tried an autogenous streptococcus vaccine but without much benefit, and when the dose was too large it produced an attack of purpura. If this treatment fails and the patient is unduly anæmic a blood transfusion should be given. Its effect may be only temporary, but it will probably stop the bleeding and lessen the anæmia.

In chronic cases, where other treatment has failed, splenectomy must be considered. The results, if the patient survives the operation, have been most encouraging, for there is often immediate arrest of the bleeding and sometimes what seems to be a complete cure. Why excision of the spleen should remove the tendency to hæmorrhage is not clear, but it seems now to be a fairly well-established fact. There is usually an immediate rise in the platelet count after the operation, but this high count does not persist and yet the tendency to hæmorrhage has disappeared; as we have seen, there is no satisfactory proof that the platelet is a causal factor in the bleeding tendency. Platelets are derived from the bone-marrow, and their increase or diminution in number must be determined by the activity of production in the marrow and the facility with which they pass into the blood stream. It may be that excision of the spleen activates this process, as it seems to arrest the hæmorrhage, but of that we have no certain knowledge. Formerly it was stated that only the cases of essential thrombopenic purpura (purpura hæmorrhagica) benefited by splenectomy. That, however, seems to need confirmation. It is naturally the cases with excessive bleeding which specially call for more drastic treatment, but in the other types of purpura there seems no good reason to withhold splenectomy if other treatment has failed. Splenectomy in the more severe cases of purpura is a serious operation with a fairly high mortality, and other means of treatment should therefore first be considered. Rest in bed seems an important part of the treatment, and in milder cases it often checks the bleeding without other measures.

CASE RECORDS.

I have notes of 30 patients with purpura, and of these I have grouped 8 as purpura simplex, 11 as purpura hæmorrhagica, 10 as of the Henoch-Schönlein type, and one as a possible purpura fulminans. This classification is no doubt somewhat arbitrary, as in certain cases of purpura simplex and Henoch's purpura the bleeding from mucous membranes was almost as considerable as that in less severe cases of purpura hæmorrhagica. Indeed, at times it is difficult to say to which category a particular case should go. Also, I have not found it possible to classify my cases according to their platelet count, which seems to me so inconstant as to be of little use to the clinician; in any case the figures at my disposal are inadequate.

The first case is one of Henoch's purpura which was operated on as an "acute abdomen," and it is of special interest in that the appearances of the intestine were noted during life as well as at the post-mortem examination some three weeks later.

CASE 1, male, aged 50, was under observation in hospital from May 26th to the time of his death on June 8th, 1914. The illness started on April 4th with pains in the knee-, ankle-, and elbow-joints, which were diagnosed and treated as rheumatic. He was confined to bed for five weeks. After that he felt so well that he went to a convalescent home, where he was able to walk half a mile at a time. On the sixth day, however, he complained of severe pain in the abdomen, accompanied by vomiting, and the vomitus contained brownish matter like coffee-grounds. With the onset of the abdominal symptoms there was a return of the arthritis, and now for the first time a purpuric eruption appeared. The spots were confined to the hands and feet, but there they were very abundant. During the next ten days he had a great deal of abdominal pain, coming on in paroxysms, and sometimes lasting for hours at a time. It was always worse when the bowels moved. There was frequent diarrhœa and vomiting, and the vomitus contained altered blood. The abdominal symptoms were so severe as to suggest to the patient's doctor a ruptured gastric ulcer, and with this diagnosis he was sent into the surgical wards of the Royal Infirmary, under Prof. Peter Paterson.

On admission the patient was very collapsed and bathed in a cold sweat. The abdominal pain was almost continuous. The temperature was 100° F., and the pulse-rate 80 and of poor quality. There was marked rigidity and tenderness on palpation of the abdomen, especially in the epigastric and hypochondriac regions. The urine contained a trace of albumin. The patient was explored the next day (May 16th) by Prof. Paterson, who reported as follows: "When the abdomen was opened 5 oz. of clear straw-coloured fluid escaped. About half the small intestine was congested, the appearance suggesting an early stage of peritonitis. Over the congested area were numerous dark-coloured patches, apparently due to extravasated blood and situated just under the peritoneal covering. These varied in size from that of a pin-point to half an inch in diameter. The intestinal walls were distinctly thickened, and the lumen was distended, but not markedly so. Scattered over the affected part of the intestine at irregular intervals were distinct constrictions, such as might be produced by localised spasm of the muscle coats. These constrictions involved the whole circumference of the intestine and measured about half an inch in breadth. The walls of these parts did not seem as thick as those immediately adjoining, and they were not so congested. The pelvis contained intestine which appeared normal."

After the operation the pain in the abdomen was better, but there were still cramp-like pains from time to time which were sometimes very severe. There was melæna for several days, and on May 18th pain in the elbows, wrists, and finger-joints; these joints were swollen, as were also, although to a lesser extent, the knee- and ankle-joints. On the 20th fresh purpuric spots appeared over the affected joints, especially on their extensor aspects. There was still no hæmaturia, but the albumin had increased in amount.

Ten days after the operation the patient was transferred to the medical wards, when it was elicited that in former years he had had several attacks of "rheumatism," in one of which purpuric spots had appeared on his skin. There was no history of any renal disease or gastric trouble. The teeth were carious and some were absent. The heart and lungs seemed normal, and there was no enlargement of liver or spleen. The systolic blood pressure registered 130 mm. of mercury. The urine had a specific gravity of 1022, and contained abundant albumin but no blood or sugar. There was a faint trace of bile. There were numerous epithelial and granular casts and a few pus cells. The purpuric spots varied in size from that of a pin-head to half an inch in diameter, and were situated mostly over the extensor surfaces of the joints. The red cells numbered 3,260,000, and the white cells 9100; the hæmoglobin was 43 per cent. The films showed little abnormality beyond some variation in the size of the red cells. There were no nucleated red cells. The platelets were not counted but, judging from the films, they seemed neither increased nor lessened in number. Of the white cells 78 per cent. were polymorphonuclear, 19 per cent. lymphocytes, 2 per cent. monocytes, and 1 per cent. marrow cells. The coagulation time was not increased, but the blood did not contract as in normal blood. The patient lived for about a fortnight after admission to the medical wards, but during that time

spontaneous hæmorrhage is the outstanding symptom, there is no thrombopenia.

The increase of the bleeding time, which is also said to be characteristic of purpura hæmorrhagica, is no doubt met with in certain cases of purpura where bleeding has been going on, and in most cases it varies directly with the thrombopenia. It seems, however, to vary with the activity of the disease, as well as at different parts of the body when tested at the same time. It is therefore somewhat inconstant, even in purpura hæmorrhagica. Before we admit the significance of thrombopenia and bleeding time we must know more about them, not only in the different types of purpura, but also during different phases of the illness in individual cases. The same applies to retraction of the clot and the tourniquet test (which, by the way, may produce urticaria rather than petechiæ).

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Most cases ultimately recover (the mortality has been put down at 15 per cent.), but the more chronic cases may suffer a great deal of debility and ill-health. Certain complications may supervene, such as nephritis, endocarditis, cerebral hæmorrhage and, in Henoch's type of the disease, ulceration of the stomach or intestine. The nephritis may be acute, with dropsy, or it may be chronic, and it seems to be most often met with in the Schönlein-Henoch type of purpura. The intracranial hæmorrhage is usually meningeal in origin, and may be subpial, subdural, or pachymeningitic. Endocarditis seems to be most common in purpura with arthritis. Piney[1] suggests that endocarditis lenta is nearly related to purpura, and maintains that the skin manifestations and hæmaturia in the former are not embolic, but have a similar origin to those symptoms in purpura.

DIAGNOSIS.

The purpuric rash is very distinctive and will at once suggest the disease, but in its absence it is easy to miss the significance of the arthritis of Schönlein's type, the abdominal symptoms of Henoch's type, or hæmorrhage from a single mucous surface. The arthritis of purpura has often been mistaken for, and treated as, "rheumatism," and the abdominal colic may closely simulate embolism or thrombosis of the mesenteric artery, or some other form of the "acute abdomen." When there is bleeding from one mucous membrane only, the difficulty of diagnosis may be very real. Kidd[2] has recently recorded 21 cases of hæmaturia where he has been able to demonstrate by cystoscopic or direct examination numerous petechiæ on the mucous surface of the bladder or in the pelvis of the kidney. Some of those patients had purpuric spots on the skin, some had arthritis, and some bleeding from another mucous membrane. In such cases the nature of the hæmaturia is less difficult to appreciate, but in the absence of those other signs of purpura, or with an associated nephritis, as there was in one of his cases, the cause of the blood in the urine may remain obscure, at least without the aid of the cystoscope. The rather profuse and continuous hæmaturia which is sometimes met with in chronic nephritis, especially in children, is possibly sometimes purpuric, and a number of cases with too profuse bleeding at the menstrual periods are without doubt cases of purpura. Possibly so-called gastrostaxis has a similar explanation. Purpura is not likely to be mistaken for hæmophilia, for the history of the two conditions is very different; but less severe cases of scurvy, especially if the gums are not affected, may have a rash very like that of purpura. In scurvy, however, the purpuric spots are usually confined to the hair follicles, and situated on the outer aspects of the legs and thighs. This gives a characteristic rough surface, which is felt on passing the hand over the eruption, and which is not present in purpura.

PATHOGENESIS.

The chief lesion in purpura is an undue permeability, for the time being, of the capillary wall, which permits the transudation of red corpuscles, plasma, or whole blood. The questions are: What causes this state of the capillary? and how does it cause it? We know that certain manifestations of purpura can be produced experimentally, and in some people much more easily than in others. In so-called secondary purpura the purpura macula can be induced by injecting cobra venom. It sometimes follows the administration of such drugs as quinine and iodide of potassium. It may also occur in cerebro-spinal fever, small-pox, or scarlet fever, and it is the characteristic rash of typhus fever. The urticarial rash, too, can be induced by a variety of irritants, such as the bite of certain insects, the sting of the nettle, and even mechanical irritation, as in dermography. It is a symptom in serum disease. Indeed, urticaria is one of the commonest appearances in the allergic state, and the existence of an undue sensitisation or allergy in the urticarial subject seems to have been established. It might therefore be argued that in certain cases of purpura this undue sensitisation of the capillary wall determines an abnormal reaction to specific agents, and that whether it is inherited or acquired it constitutes the *predisposing* factor in the disease. In other diseases there are "bad antitoxin formers," and it may be that in purpura we have what has been called an immunological defect.

Of the exciting cause we have little definite information but, as in asthma, it is probably different in different cases, and perhaps different in the same case at different times. There may be some fault in the digestive tract allowing foreign proteins in an unaltered state to enter the blood stream. Or the cause may be a physical agent, such as trauma, light, or heat, which, acting on a hypersensitive tissue, liberates a histamine-like body. Kidd has drawn attention to the frequency of a local focus of infection in his series, and he isolated from some of his cases a streptococcus in pure culture. Sometimes sore-throat was complained of before the onset of purpura; sometimes it was tonsillectomy or the extraction of septic teeth that preceded the attack. He suggests that in these patients the purpura was due to a streptococcal infection of throat, teeth, or perhaps bowel, producing possibly a mild toxæmia rather than a septicæmia.

It seems to be taken for granted by certain writers that the deficiency of platelets is the cause of bleeding. They say that with a platelet count above 35,000 or 40,000 bleeding becomes completely arrested and that purpura cannot be produced experimentally

[1] Recent Advances in Hæmatology, 1927, p. 175.
[2] Kidd: Proc. Roy. Soc. Med., 1928, vol. xxi., No. 6.

properly, whereas on March 19th the serum was seen to have extruded from the clot in one and a half hours.

She reported two and a half years later and seemed to be in excellent health. The first menstrual period after the operation was rather excessive, lasting for about ten days, but after that the monthly loss was normal.

CASE 4, female, aged 17, was admitted to hospital on April 5th, 1924. For the past seven years she had bruised very readily. In 1919 she had had a severe bleeding from the nose which lasted, off and on, for three days, and left her very weak. She was in bed at this time for four months. For six months before admission the menstrual periods had been regular, but each lasted a fortnight. She had had swelling and pain of her ankle-joints 12 months before admission, but no other sign of arthritis. She had not worked for five months owing to weakness. There was no history of bleeding in other members of her family.

Heart, lungs, and abdominal organs showed no abnormality. The spleen was not enlarged, and there was no albumin or blood in the urine. The pelvic organs seemed normal. The teeth were in good order except for two molars in the left upper jaw. She was in hospital for four months, and the outstanding feature of her illness was the amount of blood lost at her periods. The blood count, which was made once a week, would show a rise to nearly normal just before the period, followed by a loss of two or three million cells at the end of the period. The red corpuscles ranged in this way from 5,230,000 to 1,430,000 per c.mm., the white cells from 9000 to 4000, and the hæmoglobin from 80 per cent. to 28 per cent. Of the white cells 67 per cent. were polymorphonuclear, 31 per cent. lymphocytes, and 2 per cent. eosinophils. The blood platelets numbered 201,000 per c.mm. when the period had been going on for three days. The only other bleedings during her stay in hospital were a very severe epistaxis on May 20th, estimated at about 20 oz., and an abundant purpuric rash, extending from the knees to the ankles, which appeared on April 28th at the onset of a menstrual period.

Treatment was by calcium in various forms, iron, and horse serum. Improvement was slow, but ultimately the patient got quite well and remained so for about 18 months, during which time the menstrual periods were regular and lasted about seven days. In the autumn of 1926 she had an attack of what was thought to be influenza. After this she was up and about, though not feeling quite well, when suddenly her period set in and seems to have continued for a fortnight, at the end of which time she died, presumably from loss of blood.

The fifth case illustrates the association of purpura with a septic focus in the jaw.

CASE 5, a man, aged 38, was admitted to hospital on June 7th, 1916, with the history that three weeks before, when drunk, he had received a blow on the jaw. Two days later he had noticed that there was slight but continuous bleeding from the gums, which were swollen and discoloured. The bleeding continued at intervals for a week, and a few days later increased in severity. For about ten days there had been purpuric spots on trunk, neck, arms, and legs. He remained at work until June 4th, when he felt so sick and giddy that he was obliged to go to bed. There had been no pains in the joints, and—except for slight epistaxis—no bleeding from other mucous surfaces. He had contracted syphilis three years before, but there had been no lesions in the mouth and no previous hæmorrhages. His diet seems to have been that of the ordinary labourer. His mouth was foul and his breath offensive; his teeth were few and bad. The gums were swollen, with blood extravasated under the mucous membrane, and there was constant oozing of blood from both upper and lower jaws. There was also a purulent discharge from the lower jaw on the left side. There were purpuric spots all over the body and bruises on the arms and one ankle. There was no œdema and no albumin in the urine. Heart, lungs, and abdominal organs showed no abnormality, and the Wassermann reaction was negative. There were no nucleated red cells, and the blood picture was that of a secondary anæmia, with leucopenia affecting the polymorphonuclear cells (the polymorphonuclear cells were 14 per cent. and the lymphocytes 84 per cent.). The platelets were not counted, but there were few visible in the film, [illegible] a definite thrombopenia. The patient was treated by horse serum, calcium lactate, and adrenalin [illegible] but he grew steadily worse and died 13 days after [illegible]

At the post-mortem examination a septic focus was found at the apex of one of the left lower molars. The gums [illegible] the alveolar margin on the left side of the lower jaw, extending forward to the canine teeth. There were [illegible] in the heart and liver, and a pneumonic con[illegible] both upper lobes. There were a few purpuric [illegible] in the legs examination, but microscopically the granular leucocytes seemed much diminished in number. The spleen was large, pale, and soft.

Case 6 seems to be a case of purpura simplex, and I quote it because the platelet count was so variable and at one time showed an increasing thrombopenia with the general improvement of the patient.

CASE 6, a boy of 10, was first admitted to hospital on Nov. 12th, 1925. Two years before he had had an epistaxis after a blow on the nose. Since then the nose had bled about every three weeks, the flow lasting for about two hours at a time. There had been no bleeding from other mucous surfaces, no arthritis, and no abdominal symptoms. He had, however, always bruised rather easily. Purpuric spots on the skin were first noted at the end of June, 1925, and since then he had hardly ever been without them. They appeared in crops, and often one crop appeared before the previous one had faded. Each crop lasted about three weeks. Previous illnesses were unimportant. A maternal grandmother had bruised too readily and a grandfather had suffered from asthma, but there was no history of bleeding in the other members of the family.

On examination the face looked rather puffy, but the urine was normal. There were purpuric spots scattered over the trunk, arms, and legs. They varied in size from 1/16 to ¼ inch in diameter. There were also half a dozen bruises from ½ to 1 inch in diameter. The teeth were carious and the tonsils enlarged. The examination of the heart, lungs, and abdominal organs was negative.

In the four weeks during which the patient was under observation the purpuric spots gradually faded and no fresh ones appeared. The red cells varied from 3,830,000 to 4,780,000 per c.mm.; the white cells from 12,187 to 21,562; hæmoglobin from 70 per cent. to 75 per cent.; and platelets from 100,000 to 264,000. Of the white cells 46 per cent. were polymorphonuclears, 34 per cent. lymphocytes, 13 per cent. monocytes, 4 per cent. transitionals, 2 per cent. eosinophils, and 1 per cent. mast cells.

The patient was readmitted to hospital on Sept. 13th, 1928, with a purpuric rash all over the body, most abundant just below the crest of the ilium. There were also three or four bruises on the skin. During the preceding three years he had almost never been free from purpuric spots, fresh crops continuously coming out. He had had one or two bleedings from the nose, the last nine months before. The liver and spleen were not enlarged, and there was no albumin in the urine. The day after admission there was some slight bleeding from the gums, but no fresh purpuric spots in the three weeks after admission. He was treated by rest in bed and three doses of horse serum at intervals of 48 hours. In three weeks' time the red cells had gradually increased in number from 4,500,000 to 6,230,000, and the hæmoglobin from 70 per cent. to 93 per cent. The white cells ranged from 13,680 to 6230.

The platelets count showed a definite thrombopenia, the platelets seeming to lessen as the red cells increased in number. It was as follows: Sept. 13th, 13,680 per c.mm.; 18th, 27,360 per c.mm.; 21st, 11,480 per c.mm.; 26th, 6230 per c.mm. On admission the bleeding time from the left ear was seven minutes; from the right ear 25 minutes. Coagulation time was normal. The tourniquet test was positive.

The last case is possibly purpura fulminans, but death might have been due to the hæmorrhage into the suprarenals.

CASE 7, a girl, aged 1 year, was admitted to hospital on Feb. 18th, 1910, at 2 A.M., and died two hours later. She had been quite well until the night before—i.e., the 17th—when she had had an attack of diarrhœa about 9 P.M. The motions were dark in colour. The baby cried and tossed about, and was apparently very ill. The lips became blue, and an eruption came out and spread quickly all over the body. On admission the temperature was 101° F. and the respiration-rate 84. The purpuric eruption was universal, even on the scalp. The spots varied in tint from bright red to blue-black, and in size from a pin-point to a five-shilling piece. The lips were cyanosed. There was a history that the mother of the child bled readily.

At the post-mortem examination the axillary and mesenteric glands were slightly enlarged, and the Peyer's patches and solitary follicles were prominent. The thymus was enlarged and weighed 14 oz. The spleen weighed 11 oz. and presented a number of dark areas suggestive of hæmorrhage. There were small patches of hæmorrhage into the lungs, and hæmorrhages into both suprarenal capsules, so that there was almost no normal suprarenal tissue left. In the kidneys there was congestion of the vessels around the periphery of the pyramids, and the urine was red in colour. The liver was not examined.

I wish to acknowledge my indebtedness to Dr. W. Mackay, my University assistant, who is responsible for the blood platelet counts.

he was clearly not well. He was lethargic and took little interest in what was going on round about him. On June 6th he had a slight rigor, with the appearance of collapse, followed by paroxysms of acute abdominal pain. There was marked rigidity and tenderness of the abdomen, but no fever or increase of pulse-rate and no melæna. On the 7th there was again much abdominal pain, and the urine contained blood and numerous blood-casts. On the 8th he suddenly collapsed, could not speak, became comatose, and died an hour later.

At the post-mortem examination the whole small intestine was found intensely congested, suggesting an infarction, but there was no sign of embolism or thrombosis. There were numerous ulcers in the small intestine, and the whole mucosa was unhealthy and showed signs of digestion. The walls of the intestine were thickened, but there was none of the constrictions seen at the operation. There was an ulcer on the anterior wall of the stomach which had perforated, but was walled off by adhesions. On the interior of the stomach there were several small ulcers and much ecchymosis. There was a localised peritonitis on the left side of the diaphragm and a small amount of yellow-coloured fluid was present. The kidneys showed signs of parenchymatous nephritis. Suprarenals, liver, spleen, heart, and lungs presented no abnormality. The brain was very œdematous but there were no hæmorrhages. The pathologist adds: "The result of the examination suggested that the condition was due to some disturbance of the vasomotor apparatus."

The second case is an example of the Henoch-Schönlein group, running a rather chronic course and complicated by nephritis and acute endocarditis.

CASE 2, a married woman, aged 52, was first admitted to hospital on May 22nd, 1921. For five or six years she had had "rheumatic" pains in her joints from time to time. In June, 1920, hard tender swellings appeared on the back and inner sides of the thighs. The skin was red over the swollen areas, and later it took on a purple or bruised appearance. In time the swellings disappeared, leaving only the discoloured skin. At the end of June the ankles became swollen and painful, and some months later the knees were similarly affected. In February, 1921, the calf of the leg became tender, swollen, and inflamed, and this was diagnosed as "phlebitis." At the end of March the left knee was more swollen and later the skin over it discoloured. Smaller swellings (urticaria ?) with subsequent discoloration appeared later on the back of the right hand and upper arm, and again on the thighs. For a year there had been intermittent bleeding from the right nostril. The family history was unimportant, and the social conditions were good. The patient, however, had for some years past had a good deal of nursing to do, and she thought she was run down.

On admission to hospital there was bruising of both thighs and of the extensor surface of the left leg. The right calf felt indurated, was tender, and had a bruised appearance. There was ecchymosis of the lower abdomen and swelling of the dorsum of the right hand. Both ankles were swollen and tender, and the left knee was swollen with effusion and the skin over it was bruised. This joint was punctured and blood, which proved to be sterile, was withdrawn. The gums were edentulous and seemed healthy. Heart, lungs, and abdominal organs presented no abnormality. The systolic blood pressure was 130 mm. of mercury. The urine contained no albumin. The red cells numbered 3,150,000, the white cells 7600, and the hæmoglobin was 52 per cent. Examination of films showed little abnormality. Of the white cells 56 per cent. were polymorphonuclear, 34 per cent. lymphocytes, and 10 per cent. monocytes and transitionals. The coagulation time was 15 minutes. The patient was in hospital for a month and was dismissed, still with swelling of the joints and a certain number of ecchymoses. During the month she had a good deal of pain in the stomach and flatulence.

She was readmitted four years later—i.e., on May 11th, 1925. She had never been free of pain in the joints since leaving hospital, but the severity varied from time to time and she was obliged to rest a great deal in bed. She had likewise many recurrences of the ecchymosis, which came out, as it were, in crops. There had been no recurrence of bleeding from the nose and no bleeding from bladder, bowel, or lungs. She had lost her appetite, suffered from nausea, and generally was in very poor health. On the inner surface of the right leg there was a large ecchymosis, extending from the knee to the ankle. The leg felt indurated and was painful to the touch. The knee- and ankle-joints were swollen and the normal contour of the joints was lost, but there was no fluctuation. The appearances of the left leg were like those of the right, but not so pronounced. There were also ecchymoses on the back of the hands and purpuric spots over the abdomen. The blood pressure was now 110/70 mm. of mercury, and there was a faint trace of albumin in the urine. The red cells ranged from 3¼ to 2¼ millions, and the white cells numbered 6250. The hæmoglobin varied from 36 per cent. to 28 per cent. Of the white cells 70 per cent. were polymorphonuclear and 30 per cent. lymphocytes. The platelets were not enumerated, but judging from the numbers in the films it seemed that there could be no considerable thrombopenia. The coagulation time was 3 minutes. During the 13 days the patient was under observation she had two attacks of very severe abdominal pain, each lasting for about 24 hours. During this time, too, urticaria appeared on the trunk, followed by purpuric spots, some of which were situated on the raised skin of the urticaria nodule. After this she gradually went down hill and died on May 24th, 1925.

At the *post-mortem examination* an acute recent endocarditis of the mitral valve was found, clusters of vegetations being present on the auricular side of the cusps. There was no sign of chronic valvular disease. The lungs were œdematous, and there were a number of small subpleural hæmorrhages over both lungs. The liver was pale and showed cloudy swelling; hæmosiderine reaction was negative. The spleen was enlarged and typically septic, but films showed no organisms. The kidneys were both smaller than normal. The cortex was narrow and the appearances were those of chronic interstitial nephritis. There were submucous hæmorrhages in the stomach but none in the intestine. The brain and its membranes were œdematous, and there was an effusion of blood-stained serum over the left cerebral hemisphere and below the dura. The right knee-joint contained blood-clot. There were also many subcutaneous and intramuscular hæmorrhages, and microscopic areas of hæmorrhage into both kidney and liver.

The third and fourth cases I regarded as purpura hæmorrhagica, but in neither was there a considerable thrombopenia. Case 3 shows the good result of splenectomy; in Case 4 the spleen was not excised.

CASE 3, *female, aged 27*, was admitted to hospital on Jan. 21st, 1926. The illness had started about ten weeks before with a feeling of weariness and weakness, and on one or two occasions she had fainted. On Nov. 11th purplish spots began to appear on the skin, first on the left thigh, then round the right knee, with one large patch behind this knee, then six spots on the dorsum of the right foot, varying in size from a sixpence to a florin, and a large patch extending from calf to heel on the outer aspect of the leg. There were a few spots on the left foot and five or six round the left knee. All these spots were level with the surface of the skin, and they were fading before spots came out on the arms, a month later. On the arms the spots were raised above the surface, like blue blisters. There was one of these on the right elbow and three round the left elbow. Three days later petechial spots appeared on the shoulders and neck, and later still on the abdomen. A week after the onset of the skin eruption bleeding started from the nose, and later from the gums. The epistaxis was at times rather profuse, and occurred each morning for a week. Then the menstrual periods became excessive, lasting sometimes for about a fortnight; the loss of blood was very considerable, especially towards the beginning of the period.

The patient had had diphtheria and scarlet fever in childhood, but otherwise had been very healthy. There was no history of "rheumatism," and no previous history of a hæmorrhagic tendency. The upper teeth were artificial and the lower in good condition. The breath was foul. There was no enlargement of liver or spleen, and heart and lungs were normal. For five weeks after admission bleeding from some mucous membrane was going on almost continuously; not more than three to four days elapsed without some hæmorrhage, which was chiefly from the nose but also from the uterus, where at times it was very considerable. There was also some bleeding from the gums and, from time to time, hæmaturia, but there were never any tube-casts in the urine. A fresh crop of purpuric spots appeared on thorax, back and front, on Feb. 9th. Treatment with large doses of calcium lactate and later with "fibrogen," first by the mouth and then subcutaneously, had little effect. The subcutaneous injections produced a local reaction which was painful, and the swelling did not subside for some days.

The spleen was excised by *Prof. Paterson* on March 1st, and the patient made a satisfactory recovery. A week after the operation an urticaria appeared, with albuminuria, but these cleared up within a few days. The red cells ranged from 2,880,000 per c.mm. on admission to 1,580,000 on Feb. 20th. The range of white cells was from 4657 to 7810, and hæmoglobin from 60 per cent. to 30 per cent. After the operation the red cells rose to 4,450,000 and the hæmoglobin to 85 per cent. The highest leucocyte count after the operation was 13,750. Before the operation the blood platelets ranged from 112,500 to 200,000, and after the operation from 205,620 to 359,375. The bleeding time before operation was ten minutes, and after operation five minutes. Before the operation the clot did not contract

base. In 10 per cent. of the cases there was well-marked gallop rhythm at the apex and, although the interpretation of this sign is still under consideration, the general consensus of opinion strongly testifies to its serious significance. Several other types of arrhythmia (premature contractions, &c.) were observed and a large number of the cases had some variety of murmur, the most usual being a systolic murmur at the mitral area with partial or complete replacement of the first heart sound.

The blood pressure figures show wide variations as may be seen in the following summary :—

	Per cent.
(1) Systolic blood pressures of or exceeding 160 mm. Hg	30
(2) Systolic blood pressures of or less than 120 mm. Hg	18
(3) Systolic blood pressures intermediate between 120 and 160 mm. Hg	52

Moreover, eight of the cases included under (1) showed readings of 200 or over, the maximum being 240, which persisted in a patient aged 68 during periods of relative physical comfort and the ultimate stages of decompensation. The following conclusions appear to have practical value :—

(*a*) Myocardial degeneration is not necessarily associated with low blood pressure.

(*b*) Myocardial degeneration and supertension frequently coexist.

(*c*) Variations in the level of the blood pressure may be expected in the decompensation stages of myocardial degeneration, high tension cases exhibiting a temporary rise in blood pressure, low tension cases a further decline.

(*d*) Return of compensation following high pressure failure in myocardial degeneration may be associated with a fall in the level of the blood pressure.

(*e*) Progressive narrowing of the pulse pressure range is a sign of grave significance, particularly if, as frequently occurs in myocardial degeneration with hypertension, the diastolic figure is abnormally high.

Finally may be mentioned that group of phenomena peculiar to stasis in the venous side of the circulatory system, for some degree of stagnation is inevitable when the mechanical efficiency of the ventricular musculature is prejudiced by degenerative changes in its structure. These signs vary in intensity with the degree of myocardial incompetence. In the earlier stages the process of stagnation will be confined to the proximal venous channels (the venæ cavæ and pulmonary veins), but sooner or later the peripheral circuit is bound to become involved and then significant signs begin to appear. These include a varied group of phenomena: cyanosis, engorgement of the superficial veins (especially obvious in the large venous trunks at the base of the neck), pulmonary congestion, enlargement of the liver, serous effusions, dropsy, &c., which bear witness to the surcharged venous circuit and the raised pressure it is called upon to sustain in conditions of myocardial incompetence and secondary dilatation.

Diagnosis.

The diagnosis of myocardial degeneration depends upon a well-balanced inquiry into the subjective complaints of the patient, combined with the objective evidence of clinical and instrumental examination. The patient, more often than not past middle life, will have experienced symptoms typical of progressive impairment of exercise-response (effort syndrome), and frequently the history is characteristic of anginal complications. In the majority of cases there will be definite clinical evidence of cardiac enlargement and the value of a careful radiological examination cannot be overestimated, for often obesity will render palpation and percussion valueless. Changes in the quality of the heart sounds may be noted in all cases of myocardial degeneration, weakening of their intensity being the rule in the more frankly typical cases of fatty degeneration, while accentuation and [illegible] will be more usual in cases combining [illegible] degeneration with high blood pressure. [illegible] may be found, premature [illegible] and arrhythmias such as those of [illegible] heart block, &c., being [illegible] exceedingly common, but it should be clearly recognised that irregularity of rhythm is by no means essential to the diagnosis of myocardial degeneration. In the same way murmurs, apart from indicating the additional presence of valvular discrepancy, reveal nothing of the actual efficiency of the myocardial structure.

As a rule there is some significant change in the pulse; the rate may be abnormally slow in senile patients or when there is definite heart-block, but on the other hand a fast pulse is extremely common in cases of myocardial degeneration, and this may become exaggerated as the circulatory compensation diminishes. The pulse tension is often raised, and there may be well-marked evidence of a generalised vascular sclerosis with varying degrees of impairment of renal efficiency. Irregularities in the rhythm are exceedingly frequent and their differential diagnosis needs careful investigation. The more usual forms of arrhythmia in myocardial degeneration include :—

1. Pulse intermissions secondary to premature contractions or some form of heart-block.
2. The gross arrhythmia typical of auricular fibrillation.
3. The pulsus bigeminus and other comparable forms of pulse in which there is a definite tendency to grouping of the heart beats.
4. The pulsus alternans.

Certain of these irregularities may be recognised on ordinary physical examination, but some form of graphic tracing, either an electrocardiogram or a polygram, is essential for others.

Another side of the problem is that myocardial degeneration may be an entirely latent process, its course of development being so gradual and insidious that the patient may for a long time overlook the somewhat intangible symptoms of his complaint. It frequently happens in this type of case that moderately acute heart failure develops in a patient hitherto regarded as healthy. Two examples may be quoted :—

1. A male, aged 53, whose previous health had been uniformly good, experienced an acute attack of angina on his return from a day's shooting in the autumn of 1927. After the attack he complained of persistent breathlessness, exhaustion, and fainting sensations, which continued in spite of treatment; also of frequent suggestions of the original pressure-pain on slight effort of any kind or sudden excitement. The clinical findings four weeks after the initial attack were briefly as follows :—

Heart considerably enlarged downwards and to the left; feeble and diffuse apex impulse in the fifth and sixth space five inches from the mid-line; rhythm regular; first heart sound toneless, distant, and at times definitely split at the apex region; soft systolic murmur at the apex and base; pulse 88, regular, small volume, easily compressed; blood pressure 110 mm. systolic, 88 mm. diastolic; definite cyanosis of the lips and slight œdema of the ankles; electrocardiogram typical of right bundle branch block.

The patient gradually improved during the next two months, but in the third week of his convalescence he died in a severe attack of angina induced by the sudden exertion of moving a heavy chair.

The second case is a somewhat striking example of myocardial degeneration in which no suspicion of heart disorder had been entertained, the previous dominant symptoms being suggestive of gastro-intestinal disturbance.

A male, aged 64, complained of attacks of dull, aching pain in the epigastrium and sensations of retained flatus, which he was inclined to think entirely depended on errors of digestion. It was, however, significant that the discomfort invariably coincided with active exertion of any kind taken soon after a meal and, in the more severe attacks, there had recently been a tendency to cramp-like sensations and numbness in both arms. The heart was moderately enlarged to the right and to the left, the area of dullness extending 2 in. to the right of the mid-line in the fourth space and 4 in. to the left in the fifth space. The rhythm was regular, the first heart sound being replaced by a long blowing systolic murmur at the apex, audible at the [illegible] The blood pressure was 110 mm. systolic and [illegible] mm. diastolic, and there was regular stasis in the [illegible] [illegible] The electrocardiogram showed [illegible] [illegible] [illegible] [illegible]

MYOCARDIAL DEGENERATION.*

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MYOCARDIAL degeneration is an exceedingly common affection and has a somewhat variable symptom-complex, with the phases and features of which it is essential to be thoroughly familiar. As its name implies, the essential factor is degenerative change in the heart muscle, and, since tissue degeneration is invariably associated with reduced functional efficiency, depression of myocardial function will be the inevitable outcome of the degenerative process. The latter may be a primary degenerative deterioration depending upon occlusive lesions in the coronary vessels or it may be secondary to some form of acute or chronic infection of the myocardium. The pathological findings in the cases of primary degeneration include necrosis, fatty change, and fibrosis in the muscle-fibres, together with grosser manifestations such as infarcts, aneurysms, fibrous bands, calcareous patches, &c. While similar changes may be recognised where degeneration follows an inflammatory process, the microscopical findings clearly define the additional presence of myocarditis, and, as often as not, endocarditis, valvulitis, or pericarditis provide coexisting naked-eye evidence of an infectious process.

I have recently analysed the records of 50 cases in whom the outstanding clinical features were typical, and from the salient facts of these records I hope to establish a clear conception of the condition, its outlook, and the prospective limitations of its treatment.

Symptoms.

Symptoms are moderately easy to interpret if we appreciate certain fundamental principles—viz., that degeneration induces impairment of reserve and inefficiency of function, and that cardiac inefficiency will not only limit the range of the heart's response, but will also prejudice the circulation in certain organs, which will themselves manifest symptoms of incompetence.

In the early stages of myocardial degeneration the signs and symptoms are usually vague and inconsistent, for so great is the reserve power of the heart in the healthy that the minor grades of impairment of function do not as a general rule exhibit well-defined subjective or objective peculiarities. On the other hand, careful inquiry will often elicit important facts in the past history; the patient may have noticed certain vague sensations—slight præcordial discomfort, a tendency to breathlessness, palpitation, momentary attacks of giddiness—associated with the ordinary efforts of his daily routine, games, exercise, &c., which he had previously undertaken with impunity. In actual fact, however, the initial manifestations of myocardial degeneration often escape observation entirely, for, in the words of the late James Mackenzie, "the patient rarely presents himself before the physician until the exhaustion of the reserve force has produced some distressing symptom; it may be breathlessness, cardiac asthma, angina pectoris, or bronchitis."

The group of cases whose investigation forms the basis of the present paper included 50 adults of ages between 37 and 75, the average age being 60; the outstanding symptoms were:—

	Per cent.
Breathlessness	80
Anginal phenomena	44
Giddiness, fainting sensations, and syncopal attacks	40
Cough	20
Nocturnal wheezing (so-called cardiac asthma)	8
Somnolence and deficient mentality	4

These illustrate the widespread effects brought about by myocardial degeneration in its fully developed form, and show that the large majority of cases are likely to suffer from breathlessness or the anginal syndrome.

Physical Signs.

Although much valuable information can be gleaned from a careful inquiry into the history, a diagnosis of myocardial degeneration often depends chiefly upon the results of physical examination. For this reason it is essential to recognise that particular complex of physical signs which characterises inefficiency of function on the part of a heart musculature in the process of degeneration. The scope and variability of these physical signs can best be appreciated by the analysis of a group of typical cases. The pulse findings included a wide range of abnormalities. The rate was definitely inconstant; in 70 per cent. of the cases it was raised to 100 or over, in 8 per cent. it was reduced to 40 or under by auriculo-ventricular heart-block, and in the remaining 22 per cent. it was within normal limits. In the large majority the pulse tension was raised, but in 22 per cent. the pulse was soft and easily compressed. Irregularities of rhythm were present in a large proportion of the cases, their order of frequency being: (1) premature contractions, (2) the gross irregularity typical of auricular fibrillation, and (3) that of heart-block. In addition six of the patients were found to have pulsus alternans, a sign which must always be regarded as extremely serious. Although it is likely to escape recognition by digital examination it is always revealed by a routine blood pressure estimation or a polygraphic tracing.

The after-history of the above six patients is as follows: two were obviously in extremis and died within a fortnight, one cannot be traced, two died within 12 months, one died 15 months after the condition was first recognised. The last combined several features of interest; his case was briefly as follows:—

Male, aged 61, had been under treatment for high blood pressure for ten years; his symptoms included an increasing degree of breathlessness with effort, giddiness when stooping, a gripping pain under the breast bone which, as a rule, spread across the chest and down the left arm, and a tendency to swelling of the ankles at the end of the day. His heart was considerably enlarged downwards and to the left; the impulse was forcible and diffuse in the sixth space, 4¾ in. from the mid-line. The rhythm was irregular with frequent premature contractions. There was a long, blowing, systolic murmur at the apex, replacing the first sound, and an accentuated second sound at the aortic region. The pulse-rate was 92 with well-marked alternation. The vessels were thickened and the blood pressure was 184 mm. systolic, 104 mm. diastolic. There was definite venous engorgement of the jugular vessels, lungs, and mucous membranes, and slight œdema of the ankles. The urine showed a cloud of albumin. The electrocardiographic curves were marked by widening and notching of the R S complexes and complete flattening of the T waves in all the leads.

Under treatment this patient maintained slight improvement for a time, but later his signs and symptoms became progressively aggravated; the anginal syndrome became more intense in spite of complete rest, and the patient was seldom free from what he described as "a bracelet on his arm" and persistent tenderness of the muscles of his chest. He eventually died of an acute coronary thrombosis.

The Heart.

Cardiac enlargement is obvious on physical examination in the large proportion of cases. In 36 per cent. of the group under consideration enlargement was considerable; in 32 per cent. it was moderate; in 20 per cent. it was slight, and in the remaining 12 per cent. the size did not exceed normal limits. The apex impulse was in no way characteristic—every type of abnormality was encountered—except that the majority of cases had excessive and forcible pulsation, in conformity with the varying degrees of cardiac enlargement. Auscultation revealed certain phenomena, which we regard as definitely helpful in the diagnosis; frequently there was diminution in the tone and intensity of the heart sounds, and in many cases the combination of a poor quality first sound with a relatively accentuated second sound. The first sound was at times inaudible, both at apex and

* Being an address delivered before the Margate Medical Society.

arterio-sclerosis or of the anginal syndrome. Under these circumstances mental and physical relaxation (possibly a period of complete rest) will be essential; dietary regulations must be laid down, specially emphasising the necessity for small meals, simple, easily digestible food, slow eating, careful mastication, moderation in stimulants, and quietude after meals. Efficient elimination must be ensured by aperients when necessary, with an occasional (once or twice weekly) dose of calomel or blue pill. Adequately restful nights must be secured, such simple remedies as the bromides, luminal, chloralamide, or sulphonal sufficing in certain cases, while others require chloral or opiates. Suitable drug treatment will be needed for well-marked anginal manifestations. Apart from the usual emergency remedies (nitrites, diffusible stimulants, morphia, &c.) certain of these cases seem to respond best to sodium iodide in large and increasing dosage (grs. x.–xl. t.d.s.), others to theominal (luminal in combination with theobromine). Taken over long periods the latter remedies may have depressing effects, to obviate which it is wise to alternate occasional courses (perhaps one week in four) of some reliable general tonic, such as Fowler's solution, combined with strychnine or nux vomica and perhaps an iron preparation.

Digitalis in myocardial degeneration needs most careful consideration; its range of utility is exceedingly narrow for, quite apart from the fact that it may be distinctly contra-indicated, as in partial heart-block, there is no clinical evidence to warrant its routine prescription. Digitalis treatment, except under certain special circumstances, has no useful application in the treatment of myocardial degeneration. The special circumstances include certain of the well-known complications—viz., auricular fibrillation, auricular flutter, and dilatation with congestive heart failure. In the two former digitalis will usually prove an exceedingly efficient remedy and in the latter its effect may be no less dramatic, improved cardiac action accompanying diuresis and the disappearance of dropsical effusions. Apart from the diuresis, which is probably itself responsible for an improved vital capacity, the effects of digitalis may be singularly negative in cases with normal heart rhythm, and it is especially important to realise that the slowing effect of the drug is, under such circumstances, not forthcoming.

In certain cases it may become necessary to prescribe others of the more reliable diuretics—for instance, diuretin, theocine sodium acetate, urea, saline, &c., and, failing these, novasural injections.

In all cases of congestive heart failure adequate elimination (purgation, diuresis, and skin action) forms a most essential part of the treatment. In the presence of venous stasis depletive treatment—the application of leeches or a venesection—may enormously help the patient's comfort and general progress.

Varying degrees of obesity may complicate the clinical picture and outlook, and suitable treatment must be provided for this condition. Dietary regulations will prescribe simple food, small dry meals, strict moderation in all forms of starchy food, sugars, and fats; nitrogenous food in normal average quantity; preferably no alcoholic drinks; fluids to be taken between the meals. The question of exercise will require careful consideration; in the relatively mild [illegible] some form of exercise suitable to the [illegible] age, build, mentality, financial status, &c., [illegible] be chosen. It may be advisable to recommend [illegible] walking exercise, Swedish exercises, rowing, [illegible], games such as croquet or golf, easy [illegible] the like, always instructing the patient [illegible] precautions against over-strain, [illegible] any effort syndrome at the time and [illegible] fatigue. In the more advanced cases [illegible] will be [illegible] essential, but restrictions [illegible] required. General massage, tabloid [illegible] massage, walking exercise [illegible] Swedish movements that provide definite improvement in the metabolism and circulation, and so restore the level of myocardial reserve.

Should there be any suspicion of endocrine unbalance it may be an advantage to prescribe courses of thyroid and pituitary extracts, their effect being closely watched and if possible controlled by testing the basal metabolism at intervals during the treatment.

In a certain proportion of the less advanced cases the question of suitable spa treatment may be entertained, more especially if obesity coexists. The treatment will need to be carefully supervised and excessively strenuous remedial measures should be avoided. In an ordinary case of average severity the scheme of treatment may include dietary regulations, graduated exercise (walking, mild gymnastics, &c.), diuresis and adequate purgation, intestinal lavage, warm baths, mental relaxation, and properly apportioned physical rest. After such a course of spa treatment it may be advisable for the patient to spend a few weeks at some mildly bracing seaside place before returning to his normal routine of life at home.

BACILLUS ABORTUS INFECTION IN MAN.

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A SURVEY of the literature proves that very few cases of *Bacillus abortus* infection in man have been reported in this country. A similar infection in cattle, however, has been frequently noted, and in recent years epidemiological evidence has been produced which substantiates the view that the presence of *B. abortus* in cow's milk is the probable cause of human undulant fever occurring sporadically in this country.

It was recognised early in the nineteenth century that abortion occurring in cattle was due to an infection, and abortion was artificially produced by the introduction of vaginal discharge and fœtal membranes from infected cases into the vaginas of healthy cows. In 1896 Bang[1] demonstrated the specific cause to be the bacterium now known as the *B. abortus* of Bang. Having cultivated the organism, he was able to bring about abortion by injection of pure cultures into the vagina of pregnant cows and ewes. Injection of cultures into the circulation produced similar results. He also found that the bacillus required for primary cultures, not only a specific medium consisting of nutrient agar to which liquid gelatin and sterile blood serum had been added, but also an optimum growth temperature of 37° C. and a special oxygen content indicated by the fact that the colonies developed in a definite stratum a few millimetres below the surface.

In 1887 Bruce[2] discovered the *Micrococcus melitensis* in cultures prepared from the spleen in a fatal case of Malta fever.

An extensive investigation was made by a British Commission[3] on Mediterranean fever in 1906. The investigators reported that the disease was propagated by goats. They were unable to cultivate *M. melitensis* from the milk of 10 per cent. of the goats supplying milk to various parts of Malta, and from serum reactions they concluded that 11 per cent. of the goats on that island were infected. They were also able to infect monkeys and goats by feeding with cultures isolated from the milk or by feeding with the infected milk itself.

Mohler and Eichhorn[4] as the result of their investigations, concluded that the most important symptom observed in goats affected with Malta fever was the frequency of abortions resulting in the course of the disease. Schroeder and Cotton[5] in 1911 found, as the result of an extensive agglutination with cow's milk, that 11 per cent. of the samples tested were infected with *B. abortus*. In 1914 Kennedy[6] found that agglutination of *M. melitensis* was produced by high dilutions of both milk and serum of certain cows in Ireland.

Bassett-Smith,[7] following his investigation of 69 samples of cow's milk, pointed out that the milk in some cases had a natural tendency to agglutinate *M. melitensis*, but that if care was taken most of these non-specific reactions could be avoided. He urged that the reaction should always be controlled by other methods of diagnosis before the animal could be considered to be infected. When the samples of milk had been boiled all reactions became negative. Fleischner and Meyer,[8] in 1917, inoculated guinea-pigs with samples of Certified milk and concluded that *Bacterium abortus* was, for all practical purposes, always present in the Certified milk produced in the San Francisco Bay regions. Evans,[9] in America, found great difficulty in distinguishing *Bacterium melitensis* from *Bacterium abortus*. She stated that they were alike morphologically, and there was no difference in their biochemical reactions. Both organisms produced the same results when inoculated into pregnant guinea-pigs, and serologically they were closely related. Considering the close relationship between the two organisms and the reported frequency of virulent strains of *B. abortus* in cow's milk, she expressed surprise that a disease resembling Malta fever did not prevail in America. In 1918 Byam[10] reported a case of Malta fever occurring in England. The patient's blood serum agglutinated *M. melitensis* in dilutions up to 1 in 500.

Meyer and Shaw[11] in 1920, from a comparative study of 21 cultures of so-called *M. melitensis* obtained from various sections of the world, and of 32 cultures of *B. abortus* Bang isolated in America and England, concluded that the causative organism of undulant fever in man and of Malta fever in goats cannot be distinguished morphologically or biochemically from the organism responsible for infectious abortion in domesticated animals, and further, that since the so-called *M. melitensis* appears in young cultures as a short rod it sho[illegible] as *Bacterium melitensis*. Bevan[12] [illegible] was possible for human females to contract infectious abortion from the ingestion of the organism in milk and dairy products from infected cows. Orpen,[13] writing in 1923, concluded that the organism of Rhodesian undulant fever was identical culturally, morphologically, and serologically with *B. abortus*, but differed from European *M. melitensis*; they were, however, members of one genus and produced an identical disease in man. Duncan,[14] as the result of investigations conducted in a case of undulant fever contracted in Southern Rhodesia, stated that although experimental proof that *B. abortus* from Rhodesian cattle disease was pathogenic for man had not been supplied, yet the weight of evidence pointed to *B. abortus* as the cause of Rhodesian undulant fever, and to the cow as the source of infection.

In 1925 Box and Bamforth[15] reported another case of undulant fever contracted in this country. The patient's blood serum was found to agglutinate both *M. melitensis* and *B. abortus* antigens at a titre of 1 : 2000. The blood culture and the culture from the urine proved to be sterile. The source of the infection in this case was thought to be goat's milk as the patient had on two occasions taken raw goat's milk. Carpenter and Merriam[16] reported in 1926 two cases of undulant fever; from these they isolated two strains of micro-organisms indistinguishable from *B. abortus*. The cultures behaved like *B. abortus* Bang. Intravenous injections of the cultures produced abortion in two heifers in their first pregnancies, and the cultures were recovered from the placentas and various organs of the fœtuses.

From the examination of 488 separate milk samples Wilson and Nutt[17] calculated that about 5·7 per cent. of single milks and 8·8 per cent. of mixed milks were infected with *B. abortus*.

Huddleson,[18] in America, reported three cases of *B. abortus* infection occurring in three graduate students engaged in laboratory work. Two of them had worked with cultures of *B. abortus* and the others had handled cultures of *M. melitensis* as well as *B. abortus*. As the result of his investigation, Huddleson concluded that the infection was of bovine origin in two instances, but that *M. melitensis* from the culture may have been responsible for the manifestation of a mild form of the disease in the third case. In 1927 Huddleson,[19] studying the effect of intravenous injections of acriflavine on the *B. abortus* flora of cow's milk, found that the injections were not potent as a therapeutic measure.

Bassett-Smith,[20] writing last year on the relationship of undulant fever of man to epidemic abortion of animals, did not favour the theory that *B. abortus* and *B. melitensis* were the same organism with its virulence altered by passage through different animals.

Bamforth,[21] in 1927, reported two cases of undulant fever occurring in this country. In both instances the blood serum agglutinated *M. melitensis* in a titre of 1:1000, and *B. abortus* 1 : 2000. Both patients drank cow's milk obtained from farms in their immediate vicinity, and in both instances there was a vague history of abortion occurring amongst the cattle. In neither case was there any history of goat's milk being taken nor were there any goats in the surrounding neighbourhood. Manson-Bahr[22] has recorded two more cases in this country where fever of the undulant type was present. The blood serum from the first case was found to agglutinate *M. melitensis* in 1 : 800 dilution and *B. abortus* 1 : 1200, whilst the blood serum in the second case agglutinated *M. melitensis* 1 : 640, *B. abortus* 1 : 160, and *B. typhosus* 1 : 320; further investigation proved this case to be a typhoid carrier and the *B. typhosus* was isolated from the fæces. In both instances the blood and urine cultures were sterile.

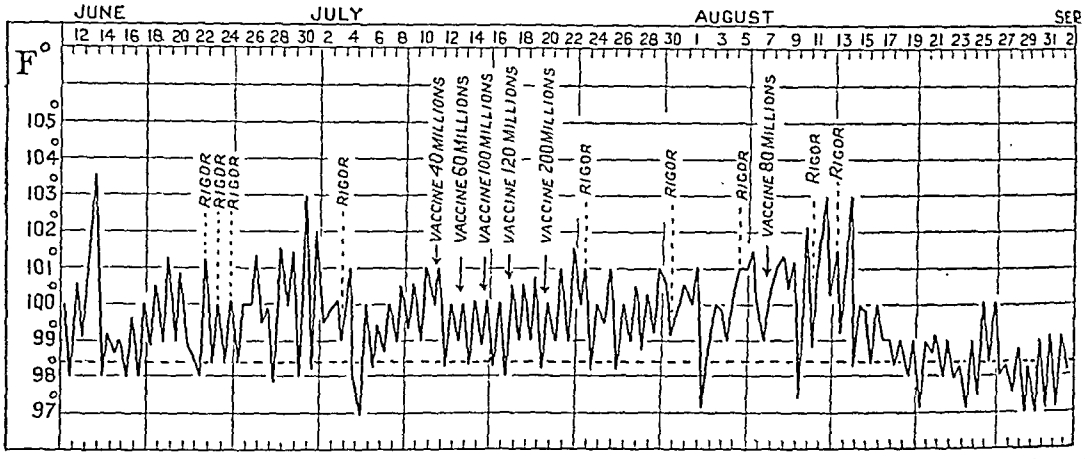

Chart to show the course of the three months undulant fever, the occurrence of rigors, and the effect of vaccine therapy.

Sensenich and Giordano [23] in America have recently reported seven cases of *B. abortus* infection in man. Habs [24] refers to five cases of undulant fever in man in Germany attributed to infection by *B. abortus*. All occurred in veterinary surgeons in contact with cows suffering from epidemic abortion.

The Author's Case.

History.—The patient was a male, aged 33, a gentleman farmer and a native of Cumberland. He had served with the British Expeditionary Force in France during the war. In 1920 he contracted malaria during a visit to Bombay. Two years later wl[illegible] was suspected to be suffering from [illegible] to England and remained healthy [illegible] present illness on June 1st, 1928, when he complained of feeling seedy and had a shivering attack. On June 2nd he motored 300 miles to attend a regimental dinner in London. He was not well during the following week, but did not seek medical advice. On June 10th he returned by motor to Cumberland. The following week he felt feverish.

On June 13th the patient had three rigors; malaria was diagnosed and quinine administered by the mouth. Examination of the blood on June 16th revealed no malarial parasites. The blood culture was sterile. Widal and Wassermann reactions were both negative.

A blood count showed erythrocytes, 5,400,000 per c.mm.; hæmoglobin, 80 per cent.; colour-index, 0·7. There was no evidence of basophilic stippling. Leucocytes, 7200 per c.mm. Differential white cell count showed polynuclear leucocytes, 50 per cent.; lymphocytes (mainly large), 46 per cent.; eosinophils, 2 per cent., and basophils, 2 per cent. From June 14th to 21st there had been no shivering attacks and the patient's general condition remained good, although pyrexia was still present (see chart). On June 22nd, 23rd, and 24th he had three more rigors, and daily intramuscular injection of quinine, grs. 10, was given in addition to administration of quinine (grs. 40) by mouth. On June 26th a blood count showed erythrocytes, 5,100,000 per c.mm.; hæmoglobin, 75 per cent.; leucocytes, 6000 per c.mm.; polynuclear leucocytes, 57 per cent.; lymphocytes (mainly large), 41 per cent.; basophils, 1 per cent.; eosinophils, 1 per cent. There was no basophilic stippling present and no malarial parasites were seen.

I first saw the patient on June 30th. Routine physical examination revealed no abnormal signs. There was no enlargement of the liver or spleen, no evidence of orchitis, and no enlargement of the lymphatic glands. The patient was removed to a nursing home for further investigation, the results of which will now be recorded.

A blood count showed erythrocytes, 4,400,000 per c.mm.; hæmoglobin, 92 per cent.; colour-index, 1·05; leucocytes, 5150 per c.mm.; these consisted of polynuclear leucocytes, 58 per cent.; lymphocytes, 36 per cent.; eosinophils, 4 per cent.; and transitional leucocytes, 2 per cent. No abnormal cells were seen, and no blood parasites discovered. A blood culture proved sterile and the Wassermann reaction negative. The blood serum was found to agglutinate *B. typhosus* in 1 : 32 dilution; this showed a sharp end-point and is of no significance, as the patient was inoculated with T.A.B. vaccine during the war. There was no agglutination of *B. dysenteriæ* Shiga or Flexner, nor of paratyphoid A and B. The urine was of specific gravity 1006, contained neither albumin nor sugar, pus, or blood cells. Cultures of the urine were sterile. The fæces contained no pathological bacteria or amœbæ.

Diagnosis.

The case was one of unexplained pyrexia lasting three weeks and associated with rigors at intervals. The first and most obvious diagnosis was that of malaria, as the patient had suffered from this complaint in 1920. The fact that he had had no return for more than six years, however, made it clear that this infection was very unlikely to be present. Moreover, no parasites had been found in the blood, and very large doses of quinine failed to produce any beneficial effect upon the temperature or general condition. Any septic conditions would seem to be ruled out by the persistent leucopenia and there was no evidence in the blood or stools of any amœbic infection leading to a liver abscess.

A miliary tuberculosis of the lungs was unlikely as the condition of the patient remained good and radiographic examination of the chest failed to show any tuberculous lesions. Moreover, recurrent rigors are unusual in miliary tuberculosis. There remained those infections which are associated with leucopenia, prolonged pyrexia, and rigors. The blood agglutination tests ruled out the typhoid and paratyphoid group of organisms. Dr. Manson-Bahr saw the case with me and suggested that the blood agglutination to the Malta fever organisms should be tested. He found a very strongly positive reaction. With *M. melitensis* complete agglutination occurred in dilution 1 : 540, while with the *B. abortus* Bang there was complete agglutination in 1 : 860. Blood cultures remained sterile up to three weeks. Further agglutination reactions obtained by Dr. Manson-Bahr from other strains of this group are conveniently recorded in Table I.

TABLE I.—*Illustrating Results of Agglutination Reactions other than those Mentioned in the Context.*

—	Serum dilutions.					
Organism ..	1 : 50	1 : 100	1 : 200	1 : 400	1 : 800	1 : 1600
B. melitense. Stock emulsion..	+ + +	+ + +	+ +	+	+	—
B. melitense Group I. ..	+ + + +	+ + + +	+ + + +	+ +	+	—
Mediterranean melitensis ..	+ + + +	+ + + +	+ + + +	+ +	+	—
Bovine abortus ..	+ + + +	+ + + +	+ + + +	+ + + +	+ +	—
Human abortus ..	+ + + +	+ + + +	+ + + +	+ + + +	+ +	—

Dr. G. T. Western kindly made an independent examination of the patient's serum and fully confirmed the results in every way. Blood cultures remained negative and there was no agglutination to any organism except *M. melitensis* and *B. abortus* Bang. Dr. Western found a positive complete agglutination to the former of 1 : 512 and partial up to 1 : 1024, while the *B. abortus* was completely agglutinated in dilution 1 in 1024 and partially up to 1 in 2048. There could be little doubt that the pyrexia was due to one of these two organisms. The cutaneous "melitene reaction" was tested. On the upper part of the left thigh an emulsion of *B. abortus* was injected intradermically while as controls, the skin was also injected with *Bacillus coli* and sterile broth. The results are given in Table II. and indicate a positive result for *B. abortus* infection.

TABLE II.—*Illustrating the Results Obtained from the "Melitene Reaction."*

Site.	Material injected intradermically.	Area of redness and exudation.	Time during which the erythema persisted.
Left thigh	*B. abortus.*	1¼ inch	7 days.
Right thigh..	Sterile broth.	¼ "	24 hours.
	B. coli.	½ "	36 hours.

Source of the Infection.

There is little doubt that cow's milk supplied the source of infection in this case. The patient had never to his knowledge partaken of goat's milk, and no goats were kept in the neighbourhood of his farm. Inquiry, however, as to the occurrence of abortion amongst the herd of cattle kept on his farm proved fruitful and potent evidence in favour of the view that the infection had occurred through the medium of cow's milk.

The first abortion amongst the patient's herd of cattle occurred in January, 1926. This animal was sold a few days later. On Dec. 15th, 16th, and 17th, 1926, three more cows aborted, one of these being milked throughout the whole of the lactation period, and the milk during the latter months was used for household purposes. All three cows were sold prior to February, 1928. A heifer aborted in January, 1927, but this animal was never milked; similarly the milk of another heifer which aborted in January, 1928, was never consumed by any members of the household. In January, 1928, ten cows and heifers in calf were inoculated against *B. abortus* infection, whilst ten more were inoculated in June, 1928. It seems therefore most likely that infection

with the *B. melitensis* can be excluded and that the case was one of *B. abortus* infection in man.

Treatment and Progress.

A vaccine containing *B. abortus* and *B. melitensis* was prepared and inoculations commenced on July 12th. These were repeated on alternate days, the initial dose being 40 million bacilli; the maximum dose given on July 20th was 200 million. The strength of the intermediate inoculations is indicated on the temperature chart. There was no improvement in the patient's condition following these injections, and they were consequently discontinued. From August 10th to August 15th five injections of colloidal manganese were given and three yatren pills were given daily. The patient gradually improved and continued to make good progress towards recovery. A slight degree of pyrexia, however, still persisted. Throughout the illness the pulse-rate varied from 80 to 120 and the patient's general condition remained good, and apart from general malaise and severe discomfort during the rigors he showed no abnormal symptoms or physical signs. The temperature gradually became normal, and since the end of September he has remained well and steadily put on weight. A suggestion was made that the patient might be benefited by being fed on the milk of a cow with a high agglutination against *B. abortus*. When, however, it was pointed out that these cows had been immunised by live cultures of *B. abortus* and eliminate large amounts of virulent *B. abortus* in their milk daily, the suggestion was not carried out.

Summary.

A review is made of the literature concerning *B. abortus* infection occurring in man and in animals, and the similarity between the *B. abortus* and *M. melitensis* and the diseases which they produce is noted. The seventh authentic case of *B. abortus* infection occurring in man in this country is reported, results of the investigations carried out in this case are recorded, and the progress made by the patient outlined.

Conclusions.

(1) In any case where exhaustive investigations have failed to discover the cause of a prolonged pyrexia, the possibility of *B. abortus* infection must not be lost sight of, and agglutination reactions against the *B. abortus* should be conducted. (2) The blood count in a case of *B. abortus* infection characteristically demonstrates leucopenia with a relative lymphocytosis. (3) Of the domesticated animals the cow appears to be the means of transmitting the infection to man in this country. Transmission of the infection by goat's milk in England has not been proved. (4) A history of abortion occurring amongst a herd of cows which supply the dairy products consumed by a patient should aid in the diagnosis of this disease. (5) The inoculation of pregnant cows with dead *B. abortus* is free of danger, but the practice of inoculating cows, even when empty and two months prior to service with live cultures of *B. ab*[illegible] is fraught with grave risks, and this procedu[illegible] be discontinued as it is known that 30 [illegible] of the injected cows pass *B. abortus* out in [illegible] and they may continue to do this for lon[illegible] (even years) following the original inject[illegible] The illness when it becomes [illegible] tablished [illegible]ery prolonged, but the [illegible] progn[illegible]d. (7) Various therapeutic [illegible] treatment of this condi[illegible] or no value. Treatme[illegible] ineffective.

I have to acknowledge [illegible] and Dr. Western and f[illegible] confirmed the agglutinati[illegible] I have also to thank Dr. W[illegible] for help in the preparation [illegible] Thomson, who sent me t[illegible] great assistance in obta[illegible]

(*References at foot c*[illegible]

THE POSSIBLE EXISTENCE IN THIS COUNTRY OF DISEASE DUE TO INFECTION WITH *BRUCELLA ABORTUS*.

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CASES of human infection with *Brucella abortus* (*Bacillus abortus* Bang) have been described in the last five years by Orpen (1923–24) and Bevan (1925) in Southern Rhodesia, by Keefer (1924), Huddleson (1926), Carpenter and Merriam (1926), Carpenter (1926), and Belyea (1927) in the United States, and by Ficai and Alessandrini (1925) and Viviani (1925) in Italy. A review of the cases reported up to February, 1927, has been furnished by Evans (1927). In this country no definite cases of infection have hitherto been reported. Duncan (1924), it is true, reported one such case, in which *Br. abortus* was recovered in pure culture from the blood, but as the patient had been a butcher in Southern Rhodesia it is probable that he had acquired his infection outside this country. Bamforth (1927), Wordley (1927), and Manson-Bahr (1927), however, have reported cases of undulant fever in which the patient's blood agglutinated *Br. abortus* or *Br. melitensis* to a titre varying from 1/160 to 1/2000, but they were not successful in demonstrating the infective organism. As infectious abortion of cattle is very common in this country, and as *Br. abortus* has been found in as many as 8·8 per cent. of mixed milks (Wilson and Nutt, 1926), it is not unreasonable to suppose that cases of active infection with this organism must occur. On the other hand, it is difficult to believe that if undulant fever were at all common in this country it should hitherto have remained undiagnosed. The suggestion therefore is that if *Br. abortus* does give rise to infection the clinical type of disease is as a rule different from that usually associated with infection due to *Br. melitensis*. A review of the reported cases of infection with *Br. abortus* lends colour to this suggestion. The case-histories are not typical of undulant fever. Instead of successive waves of fever with daily remissions, as in Malta fever, the temperature is continuous, irregular,

DR. THEODORE THOMPSON: REFERENCES.

(*Continued from previous column.*)

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or paroxysmal. The main symptoms appear to be headache, lassitude, chilliness, and joint pains or "rheumatism." The onset is insidious, and the illness so mild that many cases remain ambulant even during the febrile stage. With such a course the diagnosis can be made only by bacteriological means. The duration of the illness is variable; it may last for only a few weeks or the patient may not be finally free from symptoms for several months.

Experimental Work.

In order to ascertain, if possible, whether infections with *Br. abortus* do occur in England, we decided to examine a number of blood sera for the presence of agglutinins to this organism. The work was carried out between April and October, 1927, at the Public Health Laboratory, Manchester. Two sets of sera were chosen: 1. Wassermann sera; these came from patients who were suspected of suffering from syphilis; only those sera giving a negative reaction were employed. 2. Widal sera; these came from patients who were suspected of suffering from enteric fever; only sera giving a negative agglutination reaction to *Bacillus typhosus, B. paratyphosus* A, B, and C, *B. aertrycke* (Mutton and Newport), and *B. enteritidis Gœrtner* were employed. By examining the Wassermann sera we hoped to gain some idea of the normal titre to *Br. abortus;* by examining the Widal sera we hoped to detect cases of abortus fever amongst the numerous cases of undiagnosed pyrexia from which the majority of these sera were derived.

Technique.—A strain of *Br. abortus* that had recently been isolated from a milk produced in the neighbourhood was seeded on to a number of agar plates, which were then incubated under lowered oxygen pressure at 37° C. for five days. The resulting growth was washed off with 0·5 per cent. phneolised saline, and diluted until in opacity it matched a suspension containing $700+10^6$ *B. coli* per c.cm. This constituted our stock suspension, and was used throughout the whole of the investigation. When tested against a specific immune serum it agglutinated to the same titre as the homologous organism. The sera to be examined were diluted in saline and mixed with an equal volume of bacterial suspension so as to give final dilutions of 1/10, 1/20, 1/40, 1/80, and 1/160. The mixtures were incubated for 18 hours at 55° C. in a partly filled water-bath, and the results read against a brightly illuminated dark background. Serum and saline controls were put up each time. When agglutination was observed up to the 1/160 dilution the serum—if sufficient remained—was re-tested in a series of higher dilutions. The results were as follows:—

Wassermann sera examined	998
Wassermann sera examined from patients whose age and sex were known..	940
Sera reacting at 1/10 or higher	54
Sera not reacting at 1/10 or higher..	944
Percentage of sera reacting at 1/10 or higher ..	5·41

TABLE I.—*Showing Age and Sex Distribution of the Wassermann Series of Patients.*

No. = Total number. R. = No. of reactors. N.-R. = No. of non-reactors. % R. = Percentage of reactors.

Age in years.	Wassermann sera.											
	Males.				Females.				M. and F. combined.			
	No.	R.	N.-R.	% R.	No.	R.	N.-R.	% R.	No.	R.	N.-R.	% R.
0–10	9	0	9	—	10	2	8	20·0	19	2	17	10·5
10–20	33	3	30	9·1	22	2	20	9·1	55	5	50	9·1
20–30	139	8	131	5·8	126	9	117	7·1	265	17	248	6·4
30–40	155	5	150	3·2	119	6	113	5·0	274	11	263	4·0
40–50	102	2	100	2·0	69	8	61	11·6	171	10	161	5·8
50–60	74	4	70	5·4	32	2	30	6·3	106	6	100	5·7
60–70	26	0	26	—	15	1	14	6·7	41	1	40	2·4
70 and over	5	0	5	—	4	0	4	—	9	0	9	0·0
Total..	543	22	521	4·1	397	30	367	7·6	940	52	888	5·5

From Table I. it appears that 5·5 per cent. of the population examined contained agglutinins at 1/10 or higher for *Br. abortus;* that the proportion of females reacting was nearly double that of the males; and that, though the figures for some of the different age-groups are scanty, it seems that the younger the patient the more likely is his serum to contain agglutinins. It looks, in fact, as if there is a very gradual falling off in the proportion of reactors as age advances.

TABLE II.—*Wassermann Sera: showing the Titre of the Reacting Sera.*

1/10	1/20	1/40	1/80	1/160	1/320	1/640	1/1280	Aver. titre.
17	19	11	3	2	0	1	1	1/64

Table II. seems to show that a titre up to 1/40 is by no means uncommon, and is probably of little or no significance in the diagnosis of abortus fever. A titre of 1/80 is very much less common, and may be regarded as suspicious. The patients reacting at 1/80 were all males, aged 19, 22, and 25 respectively. No history of their illness was obtainable. Of the two reacting at 1/160, one was a male aged 38, from whom no history was obtainable; the other was a female, aged 47, with an indefinite illness lasting about six months. The patient reacting at 1/640 was a male aged 56, who was diagnosed as suffering from osteitis; the patient reacting at 1/1280 was a male aged 28, diagnosed as neurosis. It is very unfortunate that precise histories were not obtainable, but it is striking to note that of the seven patients reacting at 1/80 or over, six were males of between 19 and 56 years of age.

The results of the Widal sera were as follows:—

No. of sera examined	42		
Ditto reacting at 1/10 or higher	11 = 26·2 %		
Males { Examined	28	Females { Examined ..	14
Males { Reactors	6	Females { Reactors ..	5
Age of male reactors	27, 28, 36, 41, 45, 54.		
" female "	15, 32, 44, 48, 52.		

TABLE III.

1/10	1/20	1/40	1/80	1/160	1/320	1/640	1/1280	Aver. titre.
2	0	4	0	2*	0	1	2	1/336

* Neither of these sera was titrated fully; the titre may therefore have been higher than 1/160.

History of Patients with Titres of 1/160 and Over.

CASE 1.—Male, 45 years; ex-soldier; served for several years in Malta. Suffering from pyrexia of unknown origin. Temperature varied from 99° to 103° F. No rose spots, no diarrhœa, spleen not enlarged; some delirium. Titre 1/160, or possibly higher.

CASE 2.—Male, 36; employed in gasworks. Suffering from pyrexia of unknown origin. Temperature varied from 98° to 102·6° F. No rose spots; diarrhœa for three days; delirium for two days; spleen not enlarged. Titre 1/160 or possibly higher.

CASE 3.—Male, 41. Suffering from pyrexia of unknown origin. Temperature not higher than 101·2° F. No diarrhœa, spleen not enlarged. On fourteenth day of disease titre to *Br. abortus* was 1/40; on twentieth day titre had risen to 1/640.

CASE 4.—Male, 54; railway works manager. Drinks little milk, but eats much gorgonzola cheese. Not been abroad for nearly 30 years. Insidious onset about middle of April with general apathy, malaise, and chilliness; gradually getting worse. Temperature rose to 100°–102° F. in the evening and returned to normal in the morning. Sent for doctor on June 2nd. Temperature at 8.30 P.M. was 102° F. and pulse-rate 84. Patient sent to bed and temperature came down with gradually diminishing evening rises until in five days it reached normal. Blood serum on June 7th, 1927, negative to the typhoid-paratyphoid group, but agglutinated *Br. abortus* to a titre of over 1/320. General condition improved during next ten days. On June 17th, a second specimen of serum agglutinated *Br. abortus* and *Br. melitensis* (C4 and C6 strains*) to 1/1280. Patient went

* *Br. melitensis* C4 was No. 893, C5 " No. 892, C6 " No. 891 } of Nat. Collect. of Type Cultures and belonged to Feusier and Meyer's { Group I., " II., " III.

with the *B. melitensis* can be excluded and that the case was one of *B. abortus* infection in man.

Treatment and Progress.

A vaccine containing *B. abortus* and *B. melitensis* was prepared and inoculations commenced on July 12th. These were repeated on alternate days, the initial dose being 40 million bacilli; the maximum dose given on July 20th was 200 million. The strength of the intermediate inoculations is indicated on the temperature chart. There was no improvement in the patient's condition following these injections, and they were consequently discontinued. From August 10th to August 15th five injections of colloidal manganese were given and three yatren pills were given daily. The patient gradually improved and continued to make good progress towards recovery. A slight degree of pyrexia, however, still persisted. Throughout the illness the pulse-rate varied from 80 to 120 and the patient's general condition remained good, and apart from general malaise and severe discomfort during the rigors he showed no abnormal symptoms or physical signs. The temperature gradually became normal, and since the end of September he has remained well and steadily put on weight. A suggestion was made that the patient might be benefited by being fed on the milk of a cow with a high agglutination against *B. abortus*. When, however, it was pointed out that these cows had been immunised by live cultures of *B. abortus* and eliminate large amounts of virulent *B. abortus* in their milk daily, the suggestion was not carried out.

Summary.

A review is made of the literature concerning *B. abortus* infection occurring in man and in animals, and the similarity between the *B. abortus* and *M. melitensis* and the diseases which they produce is noted. The seventh authentic case of *B. abortus* infection occurring in man in this country is reported, results of the investigations carried out in this case are recorded, and the progress made by the patient outlined.

Conclusions.

(1) In any case where exhaustive investigations have failed to discover the cause of a prolonged pyrexia, the possibility of *B. abortus* infection must not be lost sight of, and agglutination reactions against the *B. abortus* should be conducted. (2) The blood count in a case of *B. abortus* infection characteristically demonstrates leucopenia with a relative lymphocytosis. (3) Of the domesticated animals the cow appears to be the means of transmitting the infection to man in this country. Transmission of the infection by goat's milk in England has not been proved. (4) A history of abortion occurring amongst a herd of cows which supply the dairy products consumed by a patient should aid in the diagnosis of this disease. (5) The inoculation of pregnant cows with dead *B. abortus* is free of danger, but the practice of inoculating cows, even when empty and two months prior to service with live cultures of *B. abortus*, is fraught with grave risks, and this procedure should be discontinued as it is known that 30 per cent. of the injected cows pass *B. abortus* out in their milk, and they may continue to do this for long periods (even years) following the original injections. (6) The illness when it becomes established may be very prolonged, but the ultimate prognosis is good. (7) Various therapeutic measures recommended in the treatment of this condition have proved to be of little or no value. Treatment by vaccines appears to be ineffective.

I have to acknowledge help from Dr. Manson-Bahr and Dr. Western and from Sir A. Castellani, who confirmed the agglutination results already obtained. I have also to thank Dr. W. Evans, my first assistant, for help in the preparation of these notes. Dr. J. R. K. Thomson, who sent me the case, has also been of great assistance in obtaining full clinical details.

(*References at foot of next column.*)

THE POSSIBLE EXISTENCE IN THIS COUNTRY OF DISEASE DUE TO INFECTION WITH *BRUCELLA ABORTUS*.

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CASES of human infection with *Brucella abortus* (*Bacillus abortus* Bang) have been described in the last five years by Orpen (1923–24) and Bevan (1925) in Southern Rhodesia, by Keefer (1924), Huddleson (1926), Carpenter and Merriam (1926), Carpenter (1926), and Belyea (1927) in the United States, and by Ficai and Alessandrini (1925) and Viviani (1925) in Italy. A review of the cases reported up to February, 1927, has been furnished by Evans (1927). In this country no definite cases of infection have hitherto been reported. Duncan (1921), it is true, reported one such case, in which *Br. abortus* was recovered in pure culture from the blood, but as the patient had been a butcher in Southern Rhodesia it is probable that he had acquired his infection outside this country. Bamforth (1927), Wordley (1927), and Manson-Bahr (1927), however, have reported cases of undulant fever in which the patient's blood agglutinated *Br. abortus* or *Br. melitensis* to a titre varying from 1/160 to 1/2000, but they were not successful in demonstrating the infective organism. As infectious abortion of cattle is very common in this country, and as *Br. abortus* has been found in as many as 8·8 per cent. of mixed milks (Wilson and Nutt, 1926), it is not unreasonable to suppose that cases of active infection with this organism must occur. On the other hand, it is difficult to believe that if undulant fever were at all common in this country it should hitherto have remained undiagnosed. The suggestion therefore is that if *Br. abortus* does give rise to infection the clinical type of disease is as a rule different from that usually associated with infection due to *Br. melitensis*. A review of the reported cases of infection with *Br. abortus* lends colour to this suggestion. The case-histories are not typical of undulant fever. Instead of successive waves of fever with daily remissions, as in Malta fever, the temperature is continuous, irregular,

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Clinical and Laboratory Notes.

ON THE RELATIVE VALUE OF DIFFERENT MEDIA FOR THE DETECTION OF SMALL NUMBERS OF ANAEROBIC BACILLI AND THEIR SPORES.

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This investigation was undertaken in order to determine the most efficient method of detecting small numbers of organisms or spores in sera, vaccines, or any substances to be administered intravenously or subcutaneously. Four organisms were used in the trials: *B. sporogenes*, *B. tetani*, *Vibrion septique*, and *B. welchii*. The tests were carried out with 24-hours cultures of the organisms, and again with spores obtained one or more weeks after implantation. The culture media used were:—

1. *In ordinary test-tubes:*

Glucose digest broth
" " " + asbestos
" " " + meat
" " agar shakes
} uncovered and covered with liquid paraffin.

The same series made of peptone broth instead of digest broth.

2. *In Theobald Smith's tubes:*

Glucose digest broth.
" " " + asbestos.

Experiments with Implantation of 24-Hours Cultures.

A heavy growth of the organisms was obtained in a suitable medium such as glucose broth + asbestos or meat; 1 c.cm. of this was added to a tube containing 9 c.cm. of broth; from this 1 in 10 dilution further dilutions in tenfold steps were carried down until one of 1 in 1,000,000,000 was obtained.

Spores.

The organisms were grown for a week or more on blood-agar shakes in Fildes and MacIntosh's anaerobic jar and a rich spore-formation was obtained. The growth was washed off the slope with a small quantity of broth. 1 c.cm. of which, added to the first tube, gave a 1 in 10 dilution. The same series of dilutions was used as with 24-hours cultures.

Technique.

The tubes containing the test media were placed in boiling water for at least 20 minutes, and inoculated immediately after cooling. For the Theobald Smith's tubes the preliminary heating to drive off dissolved oxygen was carried out in a steam steriliser. Series of nine tubes of each medium were taken, and each of them inoculated with the same amount of the various dilutions from 1 in 1,000,000,000 to 1 in 10. The size of the inoculum proved, after a number of comparative experiments, not to have any constant influence on the resulting growth, so it was decided to use a fixed amount—namely, 100 c.mm. of each dilution. Series of experiments comparing covered and uncovered media showed that, except in the case of simple glucose broth, the layer of paraffin was apparently only a slight advantage. It must be remembered that the other liquid media contained a piece of solid material which, as shown by Fleming, promotes the growth by allowing the organisms to collect and concentrate their chemical action in a small portion of the medium. For comparison between ordinary test-tubes and Theobald Smith's tubes we used, in the test-tubes, uncovered glucose broth, which had proved very inferior to the other media, and covered glucose broth + asbestos, which, together with the meat medium and glucose agar shakes, had given the best results. The Theobald Smith's tubes contained glucose broth or glucose broth + asbestos.

In no case did Theobald Smith's tubes show growth when implanted with higher dilutions than ordinary test-tubes containing covered glucose broth + asbestos. Their only advantage is that they would detect aerobes as well as anaerobes, but they are expensive and clumsy to handle. Up to this stage digest broth had been the basis of all our media; it was now thought that comparative tests should be made with peptone broth, and in the subsequent experiments, double series of covered broth + asbestos and glucose agar shakes were put up, one of which was made up with digest broth, the other with peptone broth.

Summary.

Digest broth and peptone broth were found to give very much the same results. When the whole series of experiments performed is analysed, including many not individually presented here, it is found that:—

In 20 experiments in which the value of media containing meat and asbestos covered with paraffin was compared:

In 11, asbestos = meat medium.
In 6, " > " "
In 3, " < " "

In 19 experiments in which the value of media containing asbestos and covered with paraffin was compared with that of glucose agar shakes:

In 8, asbestos = agar medium.
In 5, " > " "
In 6, " < " "

Medium.	*B. tetani.*		*B. sporogenes.*		*Vibrion septique.*		*B. welchii.*	
	Dilutions giving rise to growth.							
	Bacilli.	Spores.	Bacilli.	Spores.	Bacilli.	Spores.	Bacilli.	Spores.
Gluc. br. (uncovered)	1/10	1/10	1/10³	1/10⁵	1/10⁴	1/10²	1/10⁷	1/10⁵
Gluc. br. + asbestos covered ..	1/10⁷	1/10⁷	1/10⁹	1/10⁹	1/10⁴	1/10⁵	1/10⁷	1/10⁶
Gluc. br. (a)	1/10⁶	1/10⁶	1/10⁶	1/10⁶	1/10⁴	1/10³	1/10⁷	1/10⁵
Gluc. br. + asbestos (a)	1/10⁶	1/10⁶	1/10⁶	1/10³	1/10⁴	1/10⁴	1/10⁷	1/10⁵
Gluc. br. (uncovered)	1/10⁴ (1 i)	Nil	Nil	1/10³	1/10	1/10⁵	1/10⁶	1/10⁴
Gluc. br. + asbestos covered ..	1/10⁷	1/10⁵	1/10⁷	1/10⁹	1/10³	1/10⁹	1/10⁷	1/10⁴
Gluc. digest br. + meat covered .	1/10⁶	1/10⁵	1/10⁷	1/10⁹	1/10³	1/10⁶	1/10⁷	1/10⁶ (3 i)
Gluc. peptone br. + meat covered	1/10⁶	1/10⁵	1/10⁵	1/10⁴ (1 i)	1/10³	1/10⁵	1/10⁷	1/10⁴
Gluc. agar shakes	1/10⁶	1/10⁶	1/10⁵	1/10⁵	1/10⁵ (1 i)	1/10⁶	1/10⁷	1/10⁶
Gluc. peptone agar shakes ..	1/10⁶	1/10⁶	1/10⁶	1/10⁷	1/10³	1/10⁶	1/10⁶	1/10⁷

1 or 3 i = 1, 2, or 3 irregularities in the sequence of positive cultures.
(a) = Theobald Smith's tubes. Gluc. br. = glucose broth.

for a holiday, but felt so ill that he returned home after two or three days. Severe night sweats and occipital headache. Improved again. On June 23rd a third specimen of serum agglutinated *Br. abortus* and *Br. melitensis* C4 to 1/640 and *Br. melitensis* C6 to 1/320. A blood culture taken on the same date remained sterile. Patient was then afebrile. With the second specimen of serum an absorption test was carried out, using *Br. abortus* and *Br. melitensis* C4, C5, and C6. The result showed that *Br. abortus* was the only organism that completely removed all agglutinins from the serum; C4 and C5 removed nearly all the agglutinins, while C6 merely lowered the titre for *Br. abortus* and C4 by about 50 to 75 per cent.

CASE 5.—Male, 27; milker on dairy farm. Never been abroad. Never drunk goat's milk, but drinks three pints of raw cow's milk a day. Pyrexia of unknown origin; temperature rises to 102·5° F. in the evening and falls to between 99·5° and 101° F. in the morning. On fourteenth day of illness patient's serum agglutinated *Br. abortus* to 1/1280. Pyrexia subsided after another week, but further records of temperature were not available. Seven weeks after commencement of illness titre to *Br. abortus* was greater than 1/5120, to *Br. melitensis* it was only 1/1280; blood culture taken then was negative.

It is interesting to note that all the patients reacting at 1/160 or over were males. Whether this was the result of examining so few sera, or whether males are actually more liable to severer grades of infection with *Br. abortus*, is impossible to say.

Discussion.

We have examined 998 Wassermann sera; of these 5·5 per cent. agglutinated *Br. abortus* to a titre of 1/10 or higher. We have also examined 42 Widal bloods, all of which were negative to organisms of the typhoid-paratyphoid group; of these 26·2 per cent. agglutinated *Br. abortus*. The average titre of the Wassermann sera, coming from presumably apyrexic patients, was 1/64; the average titre of the Widal sera, coming from presumably febrile patients, was 1/336. Unfortunately, precise histories of the positive reactors amongst the first group were unobtainable, but in the second group all of those who agglutinated *Br. abortus* to 1/160 or higher were suffering from pyrexia of unknown origin, and in two of these cases the history is not unlike that of reported cases of abortus fever. It is remarkable that whereas in both groups the proportions of females to males reacting positively is nearly 2 to 1, 11 out of the 12 patients giving what we may consider a titre higher than that liable to be found in normal blood serum are males.

The evidence that we bring forward is sufficient, we consider, to suggest that *Br. abortus* is capable of infecting human beings in this country. Until positive blood cultures have been obtained, however, this suggestion must remain unproven. The conditions under which we received the sera for examination were such as to render direct access to the patient or even a detailed case-history extremely difficult. We had therefore no opportunity of making systematic blood cultures or repeated tests of the agglutinating power of the serum. It is for this reason that we are publishing our observations in their present incomplete state. We feel that if those who have the supervision of cases of undiagnosed pyrexia, of cases of suspected pulmonary tuberculosis in which tubercle bacilli cannot be demonstrated, and of cases presenting indefinite symptoms, particularly lassitude, headache, chilliness, and bone and joint pains with occasional rises of temperature, will take the opportunity of testing the serum against *Br. abortus* and of making systematic blood cultures—taking care never to discard the cultures before ten days—then the question whether true abortus fever does occur in this country will very soon be answered.

Summary.

1. 998 sera sent in for Wassermann testing and proving negative have been examined for agglutinins to *Br. abortus*; 5·5 per cent. agglutinated this organism to a titre of 1/10 or higher. The average titre was 1/64. The proportion of females to males proving positive was nearly 2 to 1. A titre of 1/40 is not uncommonly met with, and is probably of no significance in the diagnosis of abortus fever.

2. Forty-two sera sent in for Widal testing and proving negative to members of the typhoid-paratyphoid group have been examined for agglutinins to *Br. abortus*; 26·2 per cent. agglutinated this organism to a titre of 1/10 or higher. The average titre was 1/336. The proportion of females to males proving positive was nearly 2 to 1.

3. Of 7 Wassermann sera agglutinating *Br. abortus* to 1/80 or higher, 6 came from males between 19 and 56 years of age. Of 5 Widal sera agglutinating *Br. abortus* to 1/160 or higher, all came from males between 27 and 54 years of age: all five of these were suffering from pyrexia of unknown origin. It is impossible to say from these data whether this preponderance of males showing evidence of active infection is fortuitous, or is indicative of a greater susceptibility on the part of males to the severer grades of infection.

4. The tentative conclusion is advanced that *Br. abortus* is probably capable of infecting human beings in this country; and it is suggested that blood cultures and agglutinin tests should be made on all cases of undiagnosed pyrexia and of indefinite, occasionally febrile maladies.

We wish to take this opportunity of thanking all those who have helped us in this [illegible] larly those who have kindly supplied us with information about patients under their charge.

Addendum.—An important article has just been published by Dr. M. Kristensen, of Copenhagen.† He examined 1177 Widal sera and found that 89 of them agglutinated *Br. abortus* to 1/100 or higher. Blood cultures were made from 20 of these patients, and in 13 of them an organism indistinguishable from *Br. abortus* was isolated. The technique used was to seed 3 to 5 c.cm. of the patient's blood into a fluid medium—preferably liver broth—incubate at 37° C. for 10 to 14 days in an atmosphere of 10 per cent. CO_2, and plate out at intervals on to serum or ascitic agar. Of the 89 patients 68 were males and 21 females; no patient was under 13 years of age. Clinically the picture was that of undulant fever, with sometimes severe sweating, localised pains, bronchitis, diarrhœa, or enlarged spleen. Infection occurred apparently from contact with aborting cows or from drinking raw milk or cream.

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DANGEROUS DRUGS REGULATIONS.—On and after Jan. 1st, 1929, the following drugs, besides those which are already controlled, can be dealt in only by persons licensed or authorised by the Home Secretary: coca leaves, Indian hemp (including the resins, extracts, and tinctures), and preparations containing less than 0·1 per cent. of diacetyl-morphine (heroin). Applications for licences should be addressed to the Under Secretary of State, Home Office.

nurse introduced the infection and was the means of its dissemination in the wards concerned. The character of the membrane in the nurses seems worthy of special notice. They were similar inasmuch as they were of a thin filmy nature and not having the firm adherent features of the quite typical case (as occurred in the throats of the infected children). The clinical course in each nurse was benign and no very serious features developed. Prompt antiserum therapy was resorted to in Case 1, but in Case 2 serum was omitted and a late post-diphtheritic palsy occurred.

There can be no doubt, I think, that each case was true diphtheria. The circumstantial evidence of cases following and other points add confirmation to the bacteriological and clinical findings. We have, therefore, two instances of clinical diphtheria, in Schick-negative young adults, having a benign course and showing a "modified" membrane. How can these phenomena be accounted for in the light of modern knowledge? It would seem that in these instances we have persons who have a "basal" immunity insufficient to entirely prevent infection but with power to modify the disease—and this modification not only extending to the general illness but to the local lesion also—allowing the production of a modified tonsillar exudate. Regarding the question of apparent avirulence of the Klebs-Löffler bacilli strain from Case 2, is it to be believed that the virulence of the bacillus was temporarily modified in the environment of a Schick-negative person, and its virulence enhanced on passage in the children? (We have no certain knowledge whether the children infected were previously Schick-positive, but in no case had there been any recognisable previous diphtheria infection.) If this is so we may also say that the characters of the membrane were related to the virulence.

The Question of Virulence.

The whole question of the relation of Schick reaction to clinical work is now becoming more stabilised, and certain points are practically settled—e.g., that Schick-negative carriers of virulent diphtheria bacilli are very dangerous to non-immunes. There are still some unsettled points on virulence and avirulence relationships and possible changes under different environments.

The literature on the question whether an avirulent strain ever becomes virulent is large, but the bulk of the evidence is rather against the occurrence. The clinical evidence brought forward in this note at least suggests a variable virulence under different personal susceptibilities. From the epidemiological standpoint we may say that if a person, even though he be known to be Schick-negative, develops a sore-throat and shows morphological Klebs-Löffler bacilli, he should, at least be isolated and treated as a possible danger to others, even though experimentally the strain shows a low or undetectable virulence for animals. The Schick test and immunisation certainly have values in favour of the individual, but such personal immunity may, and sometimes does, have serious consequences for the multitude.

These points can have no greater importance than for the medical officer concerned with infectious disease in a children's hospital.

THE OSLER CLUB.—A meeting was held on Dec. 7th in honour of the sixtieth birthday of Dr. Max Neuburger, professor of the history of medicine in the University of Vienna and corresponding member to the Osler Club for Austria. The foreign secretary spoke of Sir William Osler's first acquaintance with Prof. Neuburger and reminded the meeting that Osler was responsible for the English publication of the "History of Medicine" in 1910 to which he contributed a preface. Dr. J. D. Rolleston paid a tribute to Prof. Neuburger as a medical historian, emphasising the wide range of subjects covered by his work. With this tribute Sir D'Arcy Power associated himself. Messages were read from the Austrian Legation in London and from Prof. Castiglioni, the corresponding member for Italy. An opportunity was given to see an exhibition of Prof. Neuburger's published writings. The remainder of the evening was devoted to the work and life of Malpighi, the tercentenary of whose birth is celebrated this year.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF OTOLOGY.

A MEETING of this Section was held on Dec. 7th, with Mr. SOMERVILLE HASTINGS, the President, in the chair. Before the usual discussion on clinical cases there was a discussion on

MENINGITIS.

Mr. G. J. JENKINS said he had not much to add to the report which he submitted to the International Otological Congress at Paris in 1922, though some minor details he would now describe somewhat differently. He had insisted on the importance of distinguishing two groups of cases: one in which the infection was primarily of a trabeculated part of the subarachnoid space; the other in which the cisterna pantis was primarily infected. Appreciation of this greatly helped an understanding and recognition of the early symptoms of various types of meningitis, as well as assisting the rational treatment of the disease. Some cases of meningitis, even if there were micro-organisms in the cerebro-spinal fluid, had been known to recover after one or two lumbar punctures. This, he considered, proved conclusively that if the surgeon could give some degree of help the cerebro-spinal fluid might overcome the infection when it would otherwise fail to do so. In many cases of meningitis the organisms had not reached the subarachnoid space, and the meningitis was due to infection in close relation to the outer surface of the dura. In these patients a good result would follow the complete removal of the external inflammation. But it was only in the very early cases that one could be content with this procedure. The changes in the cerebro-spinal fluid could only be assessed in relation to the clinical features. There was a doubtful stage between the very early and the very advanced infections. He despaired of being able to reduce this doubtful group. He was inclined to treat them as probable infections of the subarachnoid space. Some might believe that results from surgical interference in such cases would not be so good as if they were left alone, but the speaker considered that if great care were taken in cleansing, after completing the external operation and before opening the subarachnoid, the risk to the patient was much less after the operation than if he were left without this further step. The meninges required drainage from the point of maximal infection, and the flow of normal cerebro-spinal fluid over the infected area must be encouraged.

For many years the following treatment had been carried out at King's College Hospital in cases of septic meningitis which appeared to need drainage, especially those secondary to septic labyrinthitis. Neither atropine nor morphia was given. The theatre staff and instruments were ready before the anæsthetic was administered; either ether or gas and ether was used. Iodoform was washed free of the perchloride, which had added to it modified Locke's solution. The anæsthetised patient was placed on the table on his side, and 5 or 6 c.cm. of cerebro-spinal fluid were drained off by lumbar puncture and given to the pathologist, who did a quick cytological and chemical examination. The patient was then turned on to his back, and the superior and inferior labyrinthotomy operations were completed. Tissue and mucous membrane likely to be grossly infected must be removed. The wound was syringed out with hydrogen peroxide and saline, then thoroughly syringed with a 2 per cent. alcoholic solution of iodine. A fine needle was passed into the labyrinth and the interior well douched with the iodine solution. By this time the pathologist's report would have been received, and the surgeon could decide whether or not drainage was necessary. Before anything further was done the patient was again rolled on to his side and a lumbar puncture was done, only a drop or two of the fluid escaping. Next the

In 16 experiments in which the value of media containing meat and covered with paraffin was compared with that of glucose agar shakes:

In 8, meat = agar medium.
In 4, " > " "
In 4, " < " "

Conclusions.

1. Glucose broth, uncovered, is useless for testing *B. tetani* and *B. sporogenes*. 2. With *B. welchii* and *Vibrion septique* the results were better, but this medium is obviously inferior to the others. 3. Media containing asbestos and meat, and glucose agar shakes, are of almost equal value. 4. Covered media containing meat or asbestos afford a slight advantage as compared with uncovered. 5. Media containing asbestos are easier to prepare and sterilise, and for these reasons are to be recommended.

The general technique adopted was that followed by Douglas, Fleming, and Colebrook in their work on the action of antiseptics on organisms. My sincere thanks are due to Captain S. R. Douglas for suggesting the study and for his constant advice. I have also to acknowledge the coöperation of the late Dr. G. R. James during the earlier trials, and I have to thank Dr. P. Fildes for having supplied the atoxic strain of *B. tetani* which was employed. The other cultures were obtained from the National Collection of Type Cultures.

A NOTE ON DIPHTHERIA IMMUNISATION.

By A. Victor Neale, M.D. Birm., M.R.C.P. Lond.,
RESIDENT MEDICAL OFFICER, CHILDREN'S HOSPITAL, BIRMINGHAM.

The application of the Schick reaction has now become almost a routine measure in many institutions, but its use is obviously of special value in children's hospitals. Since August, 1925, the test has been used systematically in this hospital on all members of the nursing staff. In all cases showing a positive reaction toxin-antitoxin (Burroughs, Wellcome and Co.) immunisation has been carried out promptly. The method used is that of triple injections at weekly intervals, commencing with 0·5 c.cm. and increasing to 1 c.cm. for the second and third doses respectively, each given subcutaneously. As a matter of routine each recipient is re-Schicked after an interval of three to four months. A second course of T.A.T. is given in some instances before a negative Schick reaction is produced. In one case a third course was necessary.

Table giving the Results of Schick Tests and T.A.T. Immunisation.

Year.	Nurses Schicked	Schick		Schick after T.A.T. courses.			No. of diphtheria cases in nurses.
		—	+	One.	Two.	Three.	
1923	—	—	—	—	—	—	5 (a)
1924	—	—	—	—	—	—	—
1925 (July to December)	50	31	19	17	2	0	4 (b)
1926	34	10	24	15	9	0	3 (c)
1927	38	11	27	21	5	1	3 (c)
1928	9	1	8	?	?	?	1 (d)

(a) Staff less in number than at present time.
(b) These cases occurred before Schick tests and immunisation commenced.
(c) These cases, with one exception (Nurse A), all occurred in probationers within a few weeks of admission to hospital, and before they had undergone any immunisation treatment.
(d) Nurse B (case quoted).

We see, therefore, that no diphtheria has occurred in the nurses who have been adequately immunised, with the exception of the two cases reported in this paper. The table also shows the risk which a non-immune runs on entering hospital. Like some of our other sero-diagnostic or prophylactic measures there tends to be a few instances where the results are not "according to rule," and, unfortunately, it is occasionally just these small numbers which may be of great importance. The value of the measure in this institution (as in many others) is undoubted, but during the last few months some interesting points have arisen which I think might be of some interest to others concerned with infectious disease in children's hospitals.

Two Small Ward Outbreaks.

This note is concerned with two small outbreaks of diphtheria in different wards at different times. In each instance a nurse who was definitely Schick-negative developed the disease, and in one instance, almost certainly, was the means of infecting children in the ward.

Case 1.—Nurse A.: November, 1926, Schick +; December, 1926, T.A.T. immunisation; July, 1927, Schick —.

In December, 1927, this patient was given an ethyl chloride general anæsthetic for a minor operation on the hand and apparently recovered quite well. Two days later, however, she developed a sore-throat, enlarged submaxillary glands, and a febrile reaction reaching 99·5° F. Examination of the throat revealed a thin, continuous, filmy, non-adherent greyish membrane on the left tonsil and its neighbourhood, which could be rather easily removed and which left only a hyperæmic surface without bleeding. A swab of this material showed in direct films and in some culture an almost pure growth of typical Klebs-Löffler bacilli. The patient was given 32,000 units antidiphtheritic serum, and after two days she felt much better. A few days later throat cultures were negative, but the diphtheria bacillus was present in a nasal swabbing. Unfortunately, virulence testing was not carried out with the organism obtained in this case. She made an uninterrupted recovery and no sequelæ occurred.

Points of special interest in this case were the fact that the patient was Schick-negative, the special character of the membrane, and the occurrence in the same ward of three cases of typical diphtheria within a short time of her removal.

Case 2.—Nurse B.: January, 1926, Schick-positive; February, 1926, immunised; August, 1926, Schick-negative.

In April, 1928, she complained of a slight stiffness of the neck, but not of a sore-throat. On examination, however, a thin, pale, filmy membrane was seen covering the right tonsil and fauces and giving a typical diphtheritic odour. A swab yielded an almost pure growth of Klebs-Löffler bacilli. The temperature reached a maximum of 99·5° F., and was normal after two days. In this case no antitoxin was given but the patient was placed in an isolation ward. A swab taken a week later gave a negative result and the throat was quite clear. This patient after a period of three weeks returned to duty and apparently was quite fit, but after a few days she complained of some general weakness and some ocular trouble. On examination she was found to have definite accommodation palsy and some palatal weakness. The knee-jerks were detectable, but subnormal. There was evidence [illegible] weakness. At the time of writing these [illegible] and her general condition shows impr[illegible] is normal.

The noteworthy points in this case are that the patient was Schick-negative; that the diphtheritic membrane was atypical; that no antitoxin was given; that there was evidence of neuritic sequelæ; and that animal testing with the bacillus isolated from the throat at the onset of the attack failed to show evidence of virulence in guinea-pig inoculation. Several days after this nurse was removed to isolation a case of faucial diphtheria occurred in the same ward—the patient showing a typical thick adherent membrane containing the bacillus in large numbers. At the same time another child developed nasal diphtheria. In consequence of this the ward had to be closed. It should be mentioned that all the other patients in the ward, the nursing and resident staff, showed negative swabbings.

Diphtheritic Infection in Schick-negative Persons.

Several interesting and important points come to mind on thinking over these two groups of cases. In the first place, it seems that in each instance a

Reviews and Notices of Books.

AN INDEX OF SYMPTOMATOLOGY.

By Various Writers. Edited by H. LETHEBY TIDY, M.A., M.D. Oxon., F.R.C.P. Lond., Assistant Physician to St. Thomas's Hospital; Consulting Physician to Royal Northern Hospital. Bristol: John Wright and Sons, Ltd. 1928. Pp. 710. 42s.

THIS, the latest addition to the well-known "Index" Series, is worthy of its predecessors. In general design it resembles them, in that diseases are arranged in alphabetical order throughout the book. Symptoms do not appear as headings, nor are they classified in the index. Every branch of medicine and surgery is covered, including dermatology, gynæcology, tropical diseases, and diseases of the eye, ear, and throat. Only very rare conditions are omitted, the descriptions given being designed to portray a typical case of the disease in question, and minor and unimportant variations are either omitted or dealt with very briefly.

The object aimed at has been to draw from the purely clinical aspect a clear and graphic picture of all diseases for the guidance of a practitioner unfamiliar with, or in doubt about, a particular condition; and to enable the student to obtain a vivid conception of the disease, so that it may remain imprinted on his memory. That this object has been attained there can be no question. Each article has been written by an expert in that branch of medicine, and could hardly be made more lucid or concise; those sections dealing with the nervous system are outstanding in these respects. In conditions such as diseases of the skin and tropical diseases, which are seldom seen in this country, or in which it is particularly difficult to supply a clear mental picture of the appearance by words alone, the descriptions are supplemented by excellent and well-chosen illustrations, charts, or diagrams.

In accordance with its title the book deals not at all with differential diagnosis, and only the most essential and characteristic chemical and pathological changes are mentioned; thus no reference is made to electrocardiography, and no attempt is made to describe even the simplest of clinical pathological tests. The proportion of space allotted between the various classes of diseases is evenly maintained. At first sight it might appear that tropical diseases had been given rather more than their fair share; the description of other conditions is in no way curtailed.

The book will prove of value chiefly to the student on account of its comprehensive range and the clearness and brevity of the descriptions of the clinical picture. For the practitioner who wishes to use it as a book of reference in differential diagnosis it is less suitable; but he will be able to check a provisional diagnosis by consulting the account here given of the condition and comparing it with his own observations. The book is well produced.

PHOTOMETRIC CHEMICAL ANALYSIS.

Volume I. *Colorimetry.* By JOHN H. YOE, Ph.D., Professor of Chemistry, University of Virginia. London: Chapman and Hall, Ltd. 1928. Pp. 771. 42s. 6d.

THIS work is particularly interesting, for it indicates an entirely new departure in the methods of analytical research. For many years colorimetric methods have been regarded with a certain amount of disfavour by chemists, who have gone out of their way to adhere to the so-called classical methods—volumetric and gravimetric analysis. A certain number of estimations, however, could not be made by these means and therefore colorimetric methods were introduced; but the accuracy of the results obtained was not always accepted. Perhaps one of the reasons why colorimetry has been unpopular with the pure chemist is the wholesale adoption of these methods by the biochemist, a person who has always been regarded with a certain amount of suspicion by the pure chemist. Unfortunately, the suspicion is not entirely unjustified, since some of the work published in this field has not been properly controlled. The careful work, however, of accurate investigators, like Otto Folin and many other distinguished analytical biochemists, has done a great deal to dispel these prejudices, and now colorimetric methods are recognised as being thoroughly reliable and accurate. We welcome, therefore, this volume which is devoted to colorimetry, and look forward to reading its companion which will be concerned with nephelometry.

The work opens with a chapter on general principles, followed by what must be the fullest description ever given of practically every type of colorimeter. The third and fourth chapters are devoted to the methods used in calculating the results, and include a particularly useful section on calibration and correction curves; the latter are very important, a fact which is not realised by the majority of workers. Prof. Yoe goes carefully into the whole question of the deviation from the theoretical relationship between concentration of unknown specimens and intensity of colour, and devotes much attention to the method of expressing these relations in formula, dealing with Beer's law in full. Everyone who uses a colorimeter should study this chapter. The fifth chapter, which deals with errors in colorimetry, is also admirable, and is followed by a section on stabilisers which contains many helpful tips. General directions for using a precision colorimeter are supplied by Dr. P. A. Kober, whose work in this field is well known. The remaining sections of the book are devoted to the actual methods for the determination of elements and various organic and inorganic substances, and it is safe to say that anyone following the methods given would be able to estimate any one substance in any other. The determination of metals, hydrogen-ion concentration, and organic substances, including urea, is discussed in full. The directions are sufficiently detailed to preclude any necessity for referring to other works.

The section upon the methods of blood analysis is well written, but the author does not appear to have had much practical experience in this particular branch. For instance, he gives the details for determining the blood-urea by the Folin-Wu distillation method; those who have tried to carry out this method following the original description have been baffled by the intractable frothing that occurs, to which no reference is here made. However, no man could reasonably be expected to have practical knowledge of the whole of the analytical procedure described in this book, which has evidently been prepared with very great skill and care.

DIAGNOSIS FROM INSPECTION ALONE.

Diagnostik mit freiem Auge. Eidoskopie. Third edition. By Dr. EDUARD WEISZ. Pistyan. Berlin and Vienna: Urban and Schwarzenberg. 1928. Pp. 184. M.10.

THE first edition of this book appeared in 1923, the author having worked for 20 years at the method he describes before committing it to print. His "intercostales Sprechphänomen" was discovered accidentally during compass tests on the skin, in performing which he asked patients to state whether they felt one point or two. Their answers produced visible impulses in the intercostal spaces, and this he named the speech phenomenon.

At first it seemed to be a matter purely of academic interest that the "speech impulse" could be seen everywhere over the intercostal spaces except for the inner part of the præcordium and two small rounded areas over liver and spleen, the "Leber- und Milzinsel." However, when the author discovered that the phenomenon was present over fluid but absent

opening into the internal auditory meatus was made through the inner wall of the labyrinth by the method of West and Scott. When the flow of cerebro-spinal fluid had been established, the lumbar puncture needle was connected with the reservoir of modified Locke's solution, with a fluid head of about 18 inches. When a few ounces of Locke's solution had passed through, the serum, carrying about grs. 8 of specially prepared iodoform, was injected by means of the lumbar puncture needle, and the Locke's solution was again allowed to flow until the fluid was returned clear at the ear. The wound was lightly packed with specially prepared iodoform gauze. Usually the patient, on being returned to bed, was given bromides and glucose by the rectum. As much fluid as possible should be given, also glucose. Digitalis and ephedrine seemed to produce most improvement. The sedatives mostly used were bromides and paraldehyde. If the cerebro-spinal fluid ceased to come away within 24 hours, and the patient seemed to be going back, the surgeon should seek to re-establish the drain; it might be possible to do this by the pre-cerebellar route. Plain horse serum had been used as a vehicle for the iodoform.

Mr. Jenkins next dealt with the value of maintaining a positive pressure of the cerebro-spinal fluid when operating on a septic region which communicated with the subarachnoid space. He said that if it should be necessary to operate in a septic area through which there was a leakage it was an advantage to have the cerebro-spinal fluid under positive pressure and flowing continuously rather than ebbing and flowing in the bottom of the wound.

Speaking on the leakage of cerebro-spinal fluid from the region of the ear, he said this was not frequently met with, but it was a cause of anxiety. He recalled three such cases in patients with temporo-sphenoidal abscess. In two of them the leakage occurred during the process of healing a few days after the abscess was opened. In the third leakage began some weeks after apparently sound healing. When there was leakage for a few days after the abscess was opened one could only keep the part clean and use iodoform gauze until granulation closure took place. When the leak occurred at a late stage a plastic operation should be done—i.e., moving a large flap of the temporal and sterno-mastoid muscles over the leaking area. He described briefly the three cases he referred to.

Mr. T. B. LAYTON spoke of so-called

Otitic Meningism.

His purpose, he said, was to deal with early cases which were on the way to established meningitis. At an early stage the physician was often doubtful whether the symptoms—headache, twitching, convulsions, head retraction, rigidity of trunk and limbs—were due to toxins which had got into the cerebro-spinal fluid or were the early indications of meningitis. His own view was that there was no such definite condition as meningism; and that, even if there were, it was sound policy to regard the symptoms as indicating an early stage of meningitis. The fluid at this stage would most probably show some cytological change, even if it did not contain organisms. Rigidity of the neck was, to the aural surgeon, a very definite danger signal. By the time the abdominal and other reflexes were affected the patient had passed to a stage in which his chance of recovery was small. Every patient with ear trouble who had rigidity of the neck should, he urged, be regarded as having meningitis, and lumbar puncture should not be done, because of the risk of sucking organisms from the ear to the region of the foramen magnum. He described several critical cases and his methods of dealing with them.

Mr. E. D. DAVIS spoke on the

Morbid Anatomy, Prevention, and Early Diagnosis of Otitic Meningitis.

The dura mater, he said, resisted the spread of infection from local cranial suppurations to the meninges and brain, but it was weakened at the points where nerves and vessels penetrated it and at a cranial suture. Such penetration occurred through the petrous bone; hence otitic meningitis was usually basal, and the suppuration was found in the basal cistera and in the posterior fossa. When it had extended to the basal cisternæ satisfactory drainage was almost impossible; therefore it was important to make the diagnosis before the inflammation had reached this site. When the path of infection was through the internal ear translabyrinthine drainage by the internal auditory meatus and through the inner wall of the mastoid antrum should be done early. When infection spread by the lateral sinus the posterior fossa should be drained, both in front of and behind the lateral sinus. Irrigation he did not view with favour, as it was liable to spread infection.

Acute suppuration of the middle ear or mastoid following scarlet fever had been followed by meningitis. The same could be said of measles and the acute hæmolytic streptococcal infection in children of sudden onset and rapid development. When after a mastoid operation, pain for which there was no obvious reason, headache and temperature persisted for more than two days, a careful investigation ought to be made and the mastoid reopened. In quite a considerable number of cases meningitis had followed an exacerbation of a chronic suppuration or cholesteatoma of long duration; and in these the path of infection was often through the internal ear. In a large number of cases of meningitis following chronic suppuration symptoms and signs of labyrinthitis were present. These called for prompt action.

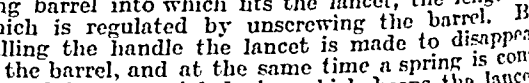
In conclusion, Mr. Davis declared that he had not regretted having drained the meninges too soon, but there were many cases known to him in which that procedure was left until it was too late to be of benefit.

A full discussion ensued, in which the following took part: Mr. E. Watson-Williams, Mr. F. W. Watkyn-Thomas, Mr. Holt Diggle, Dr. Dan McKenzie, Mr. M. Vlasto, Mr. J. Harper (Glasgow), Mr. Broughton Barnes, Mr. Sydney Scott, Mr. Musgrave Woodman, Mr. H. V. Forster (Liverpool), Sir James Dundas-Grant, Mr. T. B. Jobson, and the President.

New Inventions.

A NEW LANCET FOR OPENING A PERITONSILLAR ABSCESS.

THE difficulties which one often experiences in opening a peritonsillar abscess are only too well known. The instrument here illustrated, which is a modification of the well-known blood-letting lancet, has proved, to me, very reliable. It consists of a



long barrel into which fits the lancet, the length of which is regulated by unscrewing the barrel. By pulling the handle the lancet is made to disappear in the barrel, and at the same time a spring is compressed by a special device which keeps the lancet under tension in the desired position; the tension itself can be regulated. By pressing the handle the action of the spring is released and the lancet let loose with considerable force, thus producing a sharp and instantaneous cut. The manipulation of the instrument is very simple.

Messrs. Charles King, of Devonshire-street, London, W., are the makers.

Harley-street, W. A. A. MILLER, D.L.O.

IMPORTATION OF CHEMICALS.—The Treasury have made an Order continuing till June 30th, 1929, the exemption from duty of R. acetone, acetone fermentation, acetone synthetic, and radium compounds.

THE LANCET.

LONDON: SATURDAY, DECEMBER 29, 1928.

THE KING'S ILLNESS.

WE are happy to believe that HIS MAJESTY THE KING is now making slow but steady progress towards recovery. A week ago an official statement issued by his doctors through our columns spoke of dangerous phases in the illness having been surmounted and of increasingly solid grounds for hope of recovery. On the following afternoon the Regius professors confirmed this opinion with the statement that the KING'S progress is now established on a firmer basis. Day by day since then the local and general condition have improved, natural sleep has been restored, and the desire for food is returning. A significant sign of relaxed anxiety was the issue of a single daily bulletin on Sunday last. It may yet be too soon to speak of convalescence in view of the exhaustion which still remains as the sequel of broncho-pneumonia, empyema, and septicæmia, an evil triad which would have taxed any constitution however young or sound. No one but a medical man or a nurse knows the tediousness of recovery in these cases—the daily ups and downs among which it is hard to distinguish the slow gradual improvement. But convalescence is now in sight, and the relief has been enough to make the Christmas season more solidly and quietly happy, within and without the Palace, than would have been deemed possible earlier in the month.

THE CAUSATION OF MYOPIA.

SHORT-SIGHTEDNESS in young children is an elusive problem. Many have been the theories to account for the fact that whereas in the majority of individuals the growth of the sclerotic coat of the eyeball is approximately adapted to the purpose of focusing distant objects on to the retina, among the minority where this is not the case there are some in whom the sclerotic is unduly stretched during the early years of life so that accurate focusing can only be obtained by the use of concave lenses. Sir ARTHUR KEITH was altogether right when, a few years ago,[1] he termed myopia a disorder of growth and attributed it to a faulty reaction of the fibroblasts of the sclerotic to the stresses to which they are subject from intraocular pressure during the period of growth. This, no doubt, is a true way of putting it, and the factor of heredity, which in certain families is very prominent, obviously has to do with a defect in the process of growth. But though this primary cause exists in all myopes, and in some of them—especially cases of high myopia beginning in pre-school years—may be of such importance as to put all secondary causes into the shade, it by no means follows that all other causes may be ignored, or that we should take up a fatalistic attitude with regard to the mitigation of myopia by hygienic measures. That the constant wearing of accurately prescribed glasses itself has a favourable influence in retarding or stopping the myopic process is a belief held by many ophthalmic surgeons of very wide experience in this matter, though we know of no statistics actually proving that such is the case. Of the various secondary causes to which the phenomenon of increasing myopia has been attributed the one which has received most attention is prolonged convergence of the eyes on any near work, which is supposed to involve an increase of pressure by the external muscles of the eye and especially the superior oblique. Unfortunately for this theory it has never been proved that the pressure of the external muscles actually does increase intraocular pressure. More probable is the theory that the chief secondary cause of myopia is venous engorgement, and since this would naturally result from prolonged stooping of the head and neck, such as most forms of work at short range entail, and since it is often especially noticeable in school-children, the hypothesis seems to be a reasonable one. Twenty years ago Prof. GEORG LEVINSOHN, of Berlin, laid stress on this factor in the causation of myopia, and since that time he has attempted to reinforce his view by experiments on young apes by keeping them in the horizontal position, the result of which was not only to make them decidedly myopic, but also to produce the fundus changes typical of myopia in man. In a recent paper[2] he states that these experiments have lately been repeated and confirmed in Java by W. F. R. ESSED and M. SOEWARNO. Of seven apes experimented on, five became myopic, while the refraction of three control animals remained unchanged. In two of the animals experimented on a myopic crescent was produced, while in a third there was venous hyperæmia. The eyes were excised and sent to Prof. LEVINSOHN, who confirmed the findings by pathological examination. The proportion of animals in whom myopia was produced artificially (70 per cent.) contrasts with the 16 per cent. in which myopia is said to be normally present. By these experiments Prof. LEVINSOHN claims to have provided an irrefutable proof of his theory. To some this claim, based on such comparatively small evidence, may seem to be rather bold; nevertheless the truth of the theory is highly probable. So far as the experimental evidence goes, the most striking point is the artificial production of an myopic crescent in two monkeys. It has been objected that the myopic crescent is no proof of myopia, as it is occasionally seen in eyes that are not myopic. The answer to this is that the typical myopic crescent is not congenital, but is the result of the stretching of the eyeball during the period of growth. If the process is started in an eye originally hypermetropic it may never proceed so far as to render it myopic, but may only lessen the degree of hypermetropia. This point is well explained in a recent article[3] by A. SOURASKY on the development of myopia.

[1] See THE LANCET, 1925, i., 32.

[1] Schweizerische Medicinische Wochenschrift, November, 1928; also see Klin. Monatsbl. f. Augenh., 1928, lxxx., 56.
[2] British Jour. of Ophthalmology, December, 1928, p. 641.

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The difficult problem of the relationship between erythema nodosum and tuberculosis is stated rather than solved. In 19 out of a series of 102 cases under the author's supervision tuberculosis in some form or other was detected. This is in agreement with the general experience that a tuberculous lesion is associated with erythema nodosum in about 20 per cent. of all cases. An estimate of the significance of this fact in the matter of prognosis, and a clear account of such treatment as is called for in erythema nodosum, concludes a pleasantly written little book.

AN INTRODUCTION TO BIOPHYSICS.

Second edition. By DAVID BURNS. London: J. and A. Churchill. 1929. With 116 text-figures. Pp. 580. 25s.

MANY people have thought and think that the object of physiology is to explain life by chemistry and physics; it is an intelligible point of view, and Prof. Burns shows how it may be applied to the study of the working of the human body. Those who hold a different faith and are "debauched with the so-called science of biology" would also do well to read his book with as much sympathy as they can command; they will find a great deal of interest in it and a determined effort to apply general principles to the whole of human experience. The chief objection to the work is that it is not well written, and the argument is often confused and amorphous. The account of chlorophyll and the storage of energy, for example, could have been put much more clearly, and the paragraph on the standard deviation on p. 472 is partly unintelligible, and where intelligible not strictly accurate. In the section on the energy of growth (pp. 476 ff.) it seems that by "young animals" Prof. Burns must mean, "young warm-blooded animals," but he does not say so, and the earnest student can discover what "Rubner's second law" is only by going via the index to p. 492. The same kind of petty difficulties are present throughout the book, and it needs a more pedantic revision for its third edition.

MODERN PUBLIC CLEANSING PRACTICE.

Its Principles and Problems. By A. L. THOMPSON, M.Inst.M. and C.E., M.R.S.I., Cleansing Superintendent to the Motherwell and Wishaw Burgh Council. London: The Sanitary Publishing Co., Ltd. 1928. Pp. 261. 10s. 6d.

THIS book covers adequately the whole range of topics germane to the collection and disposal of refuse. It is concisely written, packed with information from the first chapter to the end, and contains numerous illustrations, nearly all excellently selected and reproduced. For the convenience of students appropriate questions are set at the end of each chapter, and the last page consists of a list of the works consulted. The methods of storage, collection, and disposal of refuse are clearly dealt with, and the advantages and disadvantages of each discussed in a very practical manner. Valuable information is given regarding land reclamation schemes and their management, with particular reference to the Bradford method. The chapter on street cleansing contains a useful discussion of this important subject.

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sted and Schiodt suggest that failure to acidify urine sufficiently is one of the reasons for these paratively poor results, and they think that some nts may be incapable of secreting a more strongly urine because they form too much ammonia. mmonia formed on cleavage of the hexamine, ecomposition of epithelial cells and leucocytes, he products of bacterial growth may all tend nteract urinary acidity. One reason why their are not as good as those of other workers hey suggest, be that they allowed plenty of and they give reasons for thinking that a d fluid intake should make acid disinfectant nt more efficient.

/ARNING TO STRONG SWIMMERS.

A. Young, director of the Medical Research of the Gold Coast, was a particularly expert and before his death from yellow fever last te an article [1] suggesting a possible cause of surf-bathing. In not a few autopsies on ers found washed up on the beach Dr. d that the lungs were aerated and there in the stomach, but this organ occasionally e distension. He was in the habit of e cause of death as heart failure from rtion, but a paper on hypochlorhydria wing [2] suggested to him that the air- ich took place while swimming might distension of the stomach to lead to na pectoris. In order to swim out to ge breakers it is necessary to dive en on the surface breathing is a the right moment and dodging the It is therefore necessary to hold the riods and to breathe in quick gulps ers. While these gulps may them- in amount of air-swallowing, Dr. ore probable that air entered the wimmer was under water. After held against exertion for a certain d, the respiratory centre refuses e expiratory muscles contract out a bit, and air is swallowed. , even though a deep breath had noticed that there was g of nausea and a curious fidence. Eructation gave lete relief; it had to be tore well-being, and there Both from his own tem findings Dr. Young matic distension of the diac failure. As he litional advice "not s not so much the kes up, so that a distension. If t of which not sted was to nder water t. This ort the

blood is very rapid; R. A. Hatcher and H. Gold could not detect its presence in individual specimens 30 minutes after oral or intramuscular administration. It is not merely excreted, for only 25 per cent. can thus be accounted for, the rest being broken up into simpler substances, a process for which the liver seems to be largely responsible. W. Kirschbaum has produced malarial infection by injecting blood which had been set aside for 24 hours after being mixed with quinine to the extent of 1 in 10,000, a concentration far greater than has ever been maintained in circulating blood. Again, in certain cases which they investigated, W. Ramsden, I. J. Lipkin, and E. Whitley found the quinine content of the blood to be highest, and cinchonism greatest, in those in whom parasites persisted longest. Clearly, then, quinine in itself is not plasmodicidal. But of the effect of quinine in curing malaria there is no question at all, and we must suppose that it exercises its striking action in some indirect way. We have to recognise that intravenous injection does not act by suddenly making available a large amount of parasiticidal substance. And, if the liver is the organ where quinine is not only most rapidly snatched from the circulation but most effectively turned into the plasmodicidal substance—whatever that may be—then intravenous medication does not seem to lead to the desired result as directly as administration via the mouth and portal vein. Accurate observations of the efficiency of intravenous quinine medication are due to British observers headed by J. W. W. Stephens in Liverpool and H. W. Acton in India. The latter have shown that with it the maximum disappearance of plasmodia from the blood occurs within the first 24 hours, whereas with oral administration it takes place in the third 24 hours. But there is no evidence that actual disinfestation is more readily obtained by one method than with the other, while the potential depressant action of intravenous quinine has been amply proved in India by R. McCarrison and J. W. Cornwall and by U. N. Brahmachari. Moreover, if any of the drug spill into the surrounding tissues these will slough, whilst thrombosis, so well established as occurring after its injection into varicose veins, has been reported even in healthy ones. Thus the intravenous route should probably be reserved for cases in which speedy action is essential—e.g., when there are urgent cerebral symptoms or when a swarm of subtertian parasites in the peripheral blood presages their onset—or in which the stomach refuses to retain the drug. The quinine should be introduced slowly, in considerable dilution, and in moderate doses, guarded if necessary with adrenalin; the blood pressure should be closely watched, and administration must be strictly aseptic. Intravenous quinine may in this way with reasonable safety be made available for those few special conditions in which its value has been fully demonstrated.

THE IDEAL ANNUAL HEALTH REPORT?

THE New York State Department of Health publishes every Monday a four-page sheet called *Health News*. Under the heading "Which Kind of an Annual Report is Yours?" a writer in this periodical classifies annual reports as surveys and obituaries. The latter are defined as recitations in a eulogistic, but monotonous, way of the deeds of the past. They rve merely as records which are ted only if ion demands. survey, ther hand, ls wh en ac l and how. it th which are em sharply by imu etter uch

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autumn of 1927. Again, as in 1927, the cases occurring in the winter and spring and even up to early in July, 1928, were diagnosed as typhoid or paratyphoid fever. In retrospect they are seen to have been typical cases of dengue fever.

The epidemic reached its peak in the second half of August, and from then progressively diminished, but not before nearly every inhabitant of Athens and Piræus had been stricken. The comparatively few who had been infected in the previous autumn escaped with few exceptions. From mid-August the infection was carried by incubating cases to the provinces outside Athens. It raged in the centre and south of Greece; the north was less affected, and in the northern mountains the only cases were refugees from Athens. Altitude by itself, however, is of uncertain protection, for in Syria dengue has occurred at 5000 ft. above sea-level. Clinically the illness presented its typical features—sudden onset, slight rigor, headache, increasingly severe bone and muscle pains, and fever rising to 40° C. In most cases during the first two days there was an intense erythema of face and thorax, becoming scarlatiniform on third and fourth days. At this point the temperature fell, to rise again to a maximum on sixth and seventh, or rarely eighth day, and then dropping sharply with profuse sweatings. In some the exanthem was terminal. Gastro-intestinal disturbances were frequent. In not a few there was slight albuminuria and slight pulmonary congestion. During recovery there was bradycardia. At first the epidemic was benign in character; later it became clinically severe, so that deaths occurred not only in the aged and previously diseased, but a few also in the young and previously healthy. Among these severe cases there occurred hæmoptysis, hæmatemesis, intestinal and uterine hæmorrhages, severe albuminuria and hæmaturia, cerebral hæmorrhage, convulsions, syncope, nervous and psychic troubles. The great majority of fatal cases, however, were among the aged. Relapse appeared only among those who left bed and returned too soon to everyday work, the relapse being in every feature more severe than the primary attack. Autopsies were few. They revealed no inflammatory lesions, but rather a cellular degeneration in liver, kidney, and heart. The stomach and intestines showed submucous petechiæ or larger hæmorrhages. The suprarenals were apparently unaffected. There were certainly many more than 800,000 cases: 1240 deaths were recorded. Treatment was symptomatic. The blood of infected persons showed a leucopenia with relative lymphocytosis; no spirochæte was found. Investigations undertaken by the Pasteur Institute in Athens confirmed the findings of Ashburn and Craig. Filtered and unfiltered blood conveyed the disease by direct transmission to healthy persons. The disease was also experimentally transmitted by *Aëdes egypti* 12 days after their feed on infected persons, and the aëdes remained infected during their life.

Atmospheric temperature during the summer of 1928 in Athens and generally all over Greece was high. In 1927 and throughout the summer of 1928 an astounding increase in the numbers of *Aëdes egypti* was noted. The untidy sloppiness of most Greek houses and yards provided innumerable and ideal breeding places for aëdes. It was noted at Salonika in September, 1928, that aëdes abounded in the small hutments where lived "refugees"—dengue fever smote all these families—and was entirely absent from the households of better dwellings not far off where aëdes was very scanty. Prevention obviously lies primarily in the destruction of aëdes. The community that suffers from dengue fever has deserved the visitation.

Annotations.

"Ne quid nimis."

BACILLUS ABORTUS IN MAN.

THE diagnosis of new human diseases is always an interesting process. It needs a particular genius to recognise that things which were thought to be the same are really different, and men like Addison and Bright are few and far between. But ordinary curiosity will often find a thing if it is looking for it, and it seems likely that infection with the organism which causes contagious abortion in cattle may now be definitely added to the list of our endemic human diseases. The evidence is summarised in the papers by Dr. Theodore Thompson and by Dr. H. Harrison and Dr. G. S. Wilson, which will be found in our present issue. It is not finally complete and convincing, for the organism has not been actually isolated from any of the British cases which have been identified by agglutination reactions; but it constitutes a strong case, and a wider ventilation of the possibility should soon lead to the discovery of more and conclusive examples. It is perhaps significant that the new evidence relates to the north-western counties; the disease may be commoner in some parts than others. Clinically it belongs to the large class of disease known to the honest practitioner as G.O.K. The onset is gradual and the general illness often too slight to send the patient to bed, the main symptoms being lassitude, headache, and joint pains with a certain amount of fever, which may be irregular, continuous, or paroxysmal. This goes on for weeks or even months, and there is nothing obviously diagnostic. What is so much needed is that suspicious cases should be investigated in detail and the first thing to do is to test the serum against *Bacillus* (*Brucella*) *abortus*. If a positive result is obtained the cultivation of the organism from the blood and urine should be attempted. As Dr. R. A. Kern points out[1] in an admirable article on the clinical aspects, the more the disease has been looked for in the United States the more it has been found, and the same will probably prove true in this country. He also mentions, which we very much regret, that Dr. Alice Evans, to whom so much of our knowledge of the bacteriology is due, has herself caught the infection. We wish her a speedy recovery.

THE HEALTH PROBLEMS OF A SCOTTISH BURGH.

THE translation of Dr. J. Parlane Kinloch in the coming year to the Scottish Board of Health adds a special significance to the report which he has issued as chief health officer of the royal burgh of Aberdeen. Dr. Kinloch tells us that in the course of the year 1927 the parish council and the town council unified the statutory hospital services of the city, and thus took the first step in a great project of hospital reform. The former poor-law hospital, reconditioned as a general hospital of modern type with 220 beds and an orthopædic hospital of 160 beds, was formally opened as "Woodend Hospital" on Oct. 14th, 1927, by Sir John Gilmour, Secretary of State for Scotland. The hospital has been recognised as a complete training school for nurses. Under the new arrangement the town council have taken over all the poor-law medical buildings and have undertaken the treatment of all poor-law patients, thus anticipating the proposed poor-law reforms. An extension of the city fever hospital at a cost of £57,000 is in full progress. The new Royal Hospital for Sick Children is approaching completion, and the success of the Lord Provost's appeal for £100,000 for the provision of a new Royal Infirmary and a new maternity hospital on the same site is assured. Every effort is being made by the town council to coöperate with

[1] Amer. Jour. Med. Sci., 1928, clxxvi., 405.

X RAY NOMENCLATURE.

THERE are few branches of medicine with a more troublesome vocabulary than radiology. To begin with, the radiologist is by his name a specialist in the use of rays. In practice he specialises in X rays and often also in radium, but not by any means always in rays of ultra-violet or infra-red light. The exponents of these last devices may justly be asked to invent names for themselves, for the X ray man was first on the scene. They have indeed begun to do so, for we remember having seen UVology, which perhaps is intended to be read uviology, and IRology or iriology might follow suit. But how is a specialist in X rays to be distinguished from a specialist in radium? The distinction may seldom arise, but when details of technique are being discussed it may be unavoidable. The French have solved it with precision by using *radiothérapie* alongside *radiumthérapie*. The difficulty then arises that there is no adjective or verb corresponding to "X ray." The X ray photographer probably feels this deficiency more keenly than anyone else. His work makes immense demands on skill and patience, and when his child is triumphantly brought forth he has the humiliation of being uncertain what to call it. The word "radiogram" has been snatched from under his nose and applied to a message transmitted by wireless telegraphy, whilst "radiograph," by analogy with "telegraph," suggests an apparatus rather than its product. If he applies to philological friends for a substitute they produce "skiagram," which drives him, baffled, back on the phrase "X ray photograph"; and after every lecture in which this occurs several times in quick succession he relapses into deeper despair. His difficulty when asked what he is doing to the patient is even worse. He may say he is X raying him or has X rayed him, but he cannot, if he is anything of a purist, write this. Still less can he say he is "X ray photographing" him. "Radiographing" is possible, but it does not seem to be generally accepted, and the exponents of wireless have already almost annexed it for the transmission of pictures. To meet the difficulty the Americans have boldly taken "Roentgen," the distinguished name of the inventor of X rays, and used it as the foundation of their X ray vocabulary. The subcommittee on nomenclature recently appointed by the Section on Radiology of the American Medical Association to standardise the terminology of the science have developed this plan very fully.[1] They restrict the use of "X ray" as an adjective—with a small x—to concrete nouns such as "apparatus," "tube," and presumably also "dermatitis," and recommend "roentgen" when dealing with abstractions. If their report is adopted, it will be necessary to speak of roentgen therapy and roentgen diagnosis; patients will be roentgenographed and their fractures will be illustrated in roentgenograms. Movements will be studied by roentgenoscopy—and presumably the patient will be roentgenoscoped, since the report does not include the handy term "screened." It is fairly certain that most radiologists in this country, rightly or wrongly, would sooner have no roentgenological vocabulary at all than this one. It is scientific and consistent, and the American workers already consider it adequate and admirable. Why, then, should it seem to English eyes so unspeakably hideous? The explanation probably lies in the conditioned reflex which leads the English scientific man—despite neglect of the classics—to expect a Greek or Latin root in his technical terms. When the proper name looks sufficiently like one, the incongruity passes unnoticed and no one is injured; faradic, milliampères, and galvanometry do not offend the most pedantic eye. It is unfortunate that Teutonic inventors, who are so very prolific, should mostly have names that clash with classical terminations. Even the simplest attempts to combine them, such as "Hertzian" or "Graafian," do not look right after decades of honourable use. The Teutons themselves experience the same difficulty; a terrible example is the phrase, almost an indispensable one, "struma basedowificata," meaning goitrous tissue which has undergone the changes peculiar to Graves's or Basedow's disease. In the Middle Ages some learned monk would have suggested a Latin cognomen. But there is now no clear way out of the difficulty; there is no equivalent for "roentgenograph," and the English radiologist must simply take it or leave it. In this journal it has for some time been the custom to ignore the competition of wireless, using radiogram for the photograph and radiography for the process which produces it. We do not propose to alter this convenient practice until persuaded that a change is in the public interest; nor until we are convinced that Roentgen is the best way of spelling Röntgen, whose name has just been commemorated in the term Rontgen for the new international unit of X rays. The eponymous society in this country gave a lead some years ago in spelling Rontgen without the umlaut—a lead which we gladly followed and to which we have remained faithful although the Röntgen Society has relapsed. Now that the Society has amalgamated with the British Institute of Radiology we hope they may combine in paying WILHELM CONRAD RÖNTGEN the well-merited compliment of anglicising his name.

[1] Jour. Amer. Med. Assoc., Sept. 29th, p. 960.

DENGUE FEVER.

IN 1927 the town of Durban and its vicinity swarmed with *Aëdes egypti* (*Stegomyia fasciata*). The sanitary sloth thus plainly signalled was justly rewarded during the latter half of 1927 with some 50,000 cases of dengue fever.[1] In the autumn of that year a small epidemic of dengue fever occurred in Athens; and in the summer and autumn of 1928 an epidemic of dengue of unexampled severity, which from Athens swept over nearly the whole of Greece. The main features of this epidemic were described in our issue of Sept. 1st (p. 454) and Dr. Phocion Copanaris's report to the Office International d'Hygiène Publique has now appeared.[2] Favourable climatic conditions permitted prolongation of life and development of *Aëdes egypti* all through the winter in certain quarters of the city of Athens, in warm houses, and in cess pits which by their construction held a considerably higher temperature than that of the air outside. In these warm shelters aëdes escaping the lethal action of cold formed the connecting chain between the autumn epidemic of 1927 and the culminating enormous epidemic of the summer of 1928. It has been shown that aëdes once infected remains infective for so long as she lives. During winter and spring these aëdes infected a certain number of persons who in turn infected fresh generations of aëdes. It is noteworthy that the epidemic of 1928 started in the same crowded, ill-ventilated, and insanitary quarter of Athens in which began the epidemic in the

[1] THE LANCET, 1928, i., 256.
[2] Bulletin Mensuel, October, 1928, vol. xx., No. 10.

Kelsted and Schiodt suggest that failure to acidify the urine sufficiently is one of the reasons for these comparatively poor results, and they think that some patients may be incapable of secreting a more strongly acid urine because they form too much ammonia. The ammonia formed on cleavage of the hexamine, the decomposition of epithelial cells and leucocytes, and the products of bacterial growth may all tend to counteract urinary acidity. One reason why their results are not as good as those of other workers may, they suggest, be that they allowed plenty of fluids, and they give reasons for thinking that a restricted fluid intake should make acid disinfectant treatment more efficient.

A WARNING TO STRONG SWIMMERS.

Dr. W. A. Young, director of the Medical Research Institute of the Gold Coast, was a particularly expert swimmer, and before his death from yellow fever last May he wrote an article [1] suggesting a possible cause of fatalities in surf-bathing. In not a few autopsies on native bathers found washed up on the beach Dr. Young noted that the lungs were aerated and there was no water in the stomach, but this organ occasionally showed some distension. He was in the habit of returning the cause of death as heart failure from prolonged exertion, but a paper on hypochlorhydria and air-swallowing [2] suggested to him that the air-swallowing which took place while swimming might cause sufficient distension of the stomach to lead to functional angina pectoris. In order to swim out to sea against large breakers it is necessary to dive deeply, and even on the surface breathing is a matter of picking the right moment and dodging the foam and chop. It is therefore necessary to hold the breath for long periods and to breathe in quick gulps as opportunity offers. While these gulps may themselves cause a certain amount of air-swallowing, Dr. Young thought it more probable that air entered the stomach while the swimmer was under water. After the breath has been held against exertion for a certain length of time, he said, the respiratory centre refuses to be controlled; the expiratory muscles contract slightly, the cheeks puff out a bit, and air is swallowed. On reaching the surface, even though a deep breath be taken at once, he had noticed that there was sometimes a slight feeling of nausea and a curious sensation of lack of confidence. Eructation gave immediate but not complete relief; it had to be repeated several times to restore well-being, and there might be actual vomiting. Both from his own experience and from post-mortem findings Dr. Young believed it likely that this pneumatic distension of the stomach could cause reflex cardiac failure. As he remarked, this bears out the traditional advice "not to bathe on a full stomach"; it is not so much the food that matters as the room it takes up, so that a very little air can cause a lot of distension. If eructation is impossible—and it is a feat of which not everyone is capable—the remedy suggested was to let the air slowly trickle out of the mouth under water when the respiratory strain became too great. This should relieve the intra-buccal pressure and avert the necessity for swallowing.

INTRAVENOUS QUININE.

A REPORT [3] on limitations to the use of intravenous quinine in the treatment of malaria has been presented to the Council on Pharmacy and Chemistry, New York, by Dr. Kenneth F. Maxcy, of the United States Public Health Service. In the course of an able summary he recalls that J. Morgenroth in 1918 estimated that the quinine content of the blood was 1 in 20,000 a few minutes after intravenous injection, and 1 in 150,000 after oral administration of therapeutic doses. Disappearance of the drug from the blood is very rapid; R. A. Hatcher and H. Gold could not detect its presence in individual specimens 30 minutes after oral or intramuscular administration. It is not merely excreted, for only 25 per cent. can thus be accounted for, the rest being broken up into simpler substances, a process for which the liver seems to be largely responsible. W. Kirschbaum has produced malarial infection by injecting blood which had been set aside for 24 hours after being mixed with quinine to the extent of 1 in 10,000, a concentration far greater than has ever been maintained in circulating blood. Again, in certain cases which they investigated, W. Ramsden, I. J. Lipkin, and E. Whitley found the quinine content of the blood to be highest, and cinchonism greatest, in those in whom parasites persisted longest. Clearly, then, quinine in itself is not plasmodicidal. But of the effect of quinine in curing malaria there is no question at all, and we must suppose that it exercises its striking action in some indirect way. We have to recognise that intravenous injection does not act by suddenly making available a large amount of parasiticidal substance. And, if the liver is the organ where quinine is not only most rapidly snatched from the circulation but most effectively turned into the plasmodicidal substance—whatever that may be—then intravenous medication does not seem to lead to the desired result as directly as administration via the mouth and portal vein. Accurate observations of the efficiency of intravenous quinine medication are due to British observers headed by J. W. W. Stephens in Liverpool and H. W. Acton in India. The latter have shown that with it the maximum disappearance of plasmodia from the blood occurs within the first 24 hours, whereas with oral administration it takes place in the third 24 hours. But there is no evidence that actual disinfestation is more readily obtained by one method than with the other, while the potential depressant action of intravenous quinine has been amply proved in India by R. McCarrison and J. W. Cornwall and by U. N. Brahmachari. Moreover, if any of the drug spill into the surrounding tissues these will slough, whilst thrombosis, so well established as occurring after its injection into varicose veins, has been reported even in healthy ones. Thus the intravenous route should probably be reserved for cases in which speedy action is essential—e.g., when there are urgent cerebral symptoms or when a swarm of subtertian parasites in the peripheral blood presages their onset—or in which the stomach refuses to retain the drug. The quinine should be introduced slowly, in considerable dilution, and in moderate doses, guarded if necessary with adrenalin; the blood pressure should be closely watched, and administration must be strictly aseptic. Intravenous quinine may in this way with reasonable safety be made available for those few special conditions in which its value has been fully demonstrated.

THE IDEAL ANNUAL HEALTH REPORT?

THE New York State Department of Health publishes every Monday a four-page sheet called *Health News*. Under the heading "Which Kind of an Annual Report is Yours?" a writer in this periodical classifies annual reports as surveys and obituaries. The latter are defined as recitations in a eulogistic, but monotonous, way of the deeds of the past. They serve merely as records which are consulted only if occasion demands. The survey, on the other hand, "not only tells what has been accomplished and how, but compares results, so that those things which are lacking or poorly done are emphasised sharply by contrast." Such a report stimulates to better work in the future. As an example of what such a self-analytical, stock-taking survey ought to be, the annual report of the health officer of White Plains is quoted at some length. He adopted the appraisal form of the American Public Health Association, placing the possible and the actual ratings of the health activities of White Plains side by side. A graph on the title-page showed the percentage of the possible

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[2] Russell, William: Brit. Med. Jour., 1919, ii., 769.
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the University Medical School and the voluntary hospitals. It is intended that all the statutory hospitals shall be used for teaching purposes, and it is hoped that the professors and heads of departments of the medical school will become ex-officio consultants to the municipal hospitals.

The exact details of the working arrangements between the town council and the medical school and voluntary hospitals have yet to be settled. The town council have now to provide for the parish council infants, and this has been done by the provision of ten additional cots, free from the poor-house environment, at Burnside Home for Mothers and Children. This home now has accommodation for 10 mothers and 42 children, and is mainly utilised for the admission of married women after confinement, with the object of providing them with rest and instruction in baby care. Unmarried mothers are also admitted for their first pregnancy. Another home with accommodation for 8 mothers and 10 infants is mainly used for unmarried mothers both before and after confinement. The marasmus ward in the city hospital provides 22 cots for infants suffering chiefly from nutritional disorders. As another part of the hospital reorganisation scheme arrangements have been made for the admission of post-encephalitics and epileptics as voluntary patients to Kingseat Mental Hospital. In the new hospital scheme the town council is working in full coöperation with the county council and the authorities of the other North-Eastern counties. Dr. Kinloch visualises ultimately a hospital organisation for Scotland on a regional basis grouped mainly around the four medical schools.

The report contains a review of infant mortality, undertaken by Dr. Hilda Menzies, who shows that, whereas in 1856–60 the Aberdeen infant mortality was considerably lower than that of Edinburgh, Dundee, or Glasgow, this superiority was lost in 1886–95, and in 1921–25 the figures were: Edinburgh 91, Glasgow 107, Dundee 113, Aberdeen 115. From her investigation Dr. Menzies finds that the infant mortality from "developmental diseases" during these 70 years has increased by 79 per cent. in Aberdeen, by 3 per cent. in Edinburgh, and by 1 per cent. in Dundee, whilst in Glasgow it has decreased by 9 per cent. The increase appears to be a real one in Aberdeen, and the reason why Aberdeen has lost its early advantage over the other three Scottish towns deserves the closest investigation. It has been suggested by other observers that the introduction of a foreign element has added to the vigour of the stock, and it is noteworthy that Glasgow, the town of the most hybrid stock, has shown the steadiest rate of decrease in infant mortality, whereas Aberdeen, the town of the purest race, has come off worst for infant mortality from "developmental diseases."

ANTERIOR POLIOMYELITIS.

Dr. W. M. Dickie [1] gives many interesting details of the epidemic of anterior poliomyelitis in California in 1927, and of the measures taken against it. The epidemic was at its height in July and August, and of 1270 cases reported, 237 proved fatal. How inadequate is the old name of "infantile paralysis" for the disease is shown by the fact that out of 1385 cases in which the age was recorded, 145 (or over 10 per cent.) of the patients were aged 20 or over. In this epidemic the average age at onset was perhaps unusually high, for nearly 70 per cent. of those affected were 4 years old or more, whilst nearly 40 per cent. were over 9. During the acute illness serum treatment was tried in a small proportion of the cases, but does not seem to have been very useful. A large number of deformities and disabilities inevitably remains in the track of the disease, and the organisation which deals with them largely resembles those existing in many parts of this country. Thirty-one hospitals throughout the State are open to orthopædic cases on a charitable or partly charitable basis, nine of them in San Francisco, five in Los Angeles. Ten of those in rural communities are well equipped, but the remaining seven in rural communities are stated to be not adequately equipped for treatment. There are orthopædic clinics in 13 of the counties of the State. By a recent Act of the legislative assembly of California, called the Crippled Children's Act, children up to the age of 18 years may obtain materials or appliances necessary for treatment at the public expense, but the machinery by which this help is to be obtained seems to be rather too elaborate for efficiency and likely to waste time. The State department concerned is also authorised to receive and administer gifts for the relief of cripples and to arrange through local agencies for diagnostic clinics or conferences. Since the passage of the Act 20 patients have been hospitalised, the average cost being 1000 dollars. High though this cost may seem, it has been only kept down to this level by a special hospital rate of 4 dollars a day and a special operating fee charged to the department by the surgeons concerned. Dr. Dickie thinks that the Crippled Children's Act is not entirely satisfactory. He advocates a plan whereby the State should pay one-third of the cost of treatment, charitable agencies and friends the remainder. He realises, as has been done here and elsewhere, that the long after-treatment of many of these cases cannot be carried on in hospital wards owing to its expense, and is impracticable in most homes. He therefore advocates the provision of convalescent homes.

[1] Jour. Amer. Med. Assoc., Nov. 10th, p. 1417.

ACID URINARY DISINFECTANTS.

INFECTIONS of the urinary tract are often treated by administering salts which alter the reaction of the urine and thus discourage bacterial growth. In acid urine hexamethylenetetramine may be given in combination with these salts for the antiseptic effect of the formaldehyde which is liberated from it in an acid medium. The results thus obtained are difficult to assess owing to wide variation in the type of cases treated and differences of dosage. K. Kelsted and E. Schiodt,[1] of Copenhagen, have attempted to place this acidosis therapy on a more accurate basis by finding the difference in pH of urine before and after treatment, and in their preliminary review quote the work of Rostoski who showed that the addition of acid urine to broth cultures of colon bacilli and staphylococci had an inhibitory effect on growth, this effect being proportional to the acidity. They describe their results of treatment in 28 cases of chronic pyelitis and 42 of chronic cystitis, all of which were thoroughly investigated clinically and bacteriologically, and if necessary by cystoscopy and ureteral catheterisation. The hydrogen-ion concentration of the urine was measured at intervals both before and during treatment. To acidify the urine they gave calcium or ammonium chloride in tablet form in doses of from 3 to 8 grammes daily, and in 14 cases of pyelitis and 16 of cystitis these were used alone for periods of from 8 to 35 days. In only one of them, a *B. coli* pyelitis, did the urine become sterile, and this was the one in which the acidity was greatest, reaching pH 4·7. In the next test the acid treatment was given together with urinary disinfectants; the 70 cases were treated for periods ranging from 16 to 120 days, hexamine or salol being given in 1 g. doses, or hexylresorcinol in 0·3 g. doses, three times a day. Acidity of the urine was produced in nearly all the patients, but only in seven was it sufficiently strong to give a prospect of much inhibition of bacterial growth from acidity alone, though all the samples were acid enough for the formaldehyde to be bactericidal. Five out of 28 cases of pyelitis—which were mostly long-standing—recovered completely, and the urine was proved to be sterile. Of the 42 cases of cystitis six developed sterile urine.

[1] Acta Med. Scand., 1928, lxix., 268.

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optimum score attained by White Plains, and how 1927 compared with 1926. In the case of tuberculosis control, for example, 68 points were scored out of a possible 100. The score was "perfect" on recording, on nurses' visits to cases, on follow-up of post-sanatorium cases, and on days of hospitalisation, but the clinic patients evidently did not present themselves to the clinic as promptly as they should since too few cases were discovered in the incipient stage, and there was wholly inadequate provision for open-air class-rooms, preventoria, and day camps. Popular health instruction in White Plains was shown at a glance to be much below standard, only nine out of a possible 20 points being scored in this field. Points were lost because no health bulletin was published, no use was made of motion pictures on health, and public lectures on health were but half as numerous as they should be, according to the standard set up by the American Public Health Association. On the other hand, the maximal number of points was scored as far as educational health pamphlets and newspaper publicity were concerned. Medical officers of health with a due sense of decorum and a conviction that public health is a matter within the competence of none but themselves, may perhaps find such methods as those just described more suited to a stock-taking grocer than a scientist. But there is much to be said for the medical officer of health who is willing to submit to the fierce light of publicity—to go back, as it were, to school, there to have his work examined and allotted so many marks, good or bad. The question is, do such methods promote efficiency?

THE DANGEROUS JUNKER.

FATALITIES have sometimes been caused by the pumping of liquid chloroform, instead of vapour, out of a Junker's apparatus into an unconscious patient. This is an accident in anæsthetic administration which should no longer be possible. At an inquest on a patient who died from this cause the hospital authorities are said to have stated recently that "if the apparatus could be improved in any way or better apparatus could be found" they would adopt the safe instrument. It should be known to all institutions and anæsthetists that there are several forms of Junker apparatus which are practically foolproof. For the convenience of our readers these are described and illustrated on p. 1359. Much more important, however, than the form of apparatus, is it for every administrator of anæsthetics to abide by the golden rule—never to use an apparatus without first trying it. This is the only safe way with machines, and now that machinery has invaded so largely the technique of administration of anæsthetics it is an unforgivable fault to take machinery for granted. Machines are good servants, but bad masters. If the administrator leaves safety to the apparatus, he is putting the machine in the place that should be occupied by his own skill, care, and intelligence. There has been produced, we understand, a sort of Robot anæsthetist. We can imagine no more perilous invention. The safety of those to whom a poison is being administered for any purpose must depend on the instructed care of the individual responsible for the dose. If he cannot understand, foresee, and correct the vagaries of unconscious patients' behaviour, disaster may occur. Machinery requires not less but more skill on the part of the anæsthetist than simpler methods. His first duty must always be to test his apparatus.

The coroner's jury at the inquest referred to above returned a verdict of death by misadventure and exonerated the anæsthetist, and a favourable finding by a coroner's jury is reasonably conclusive. It is, however, inevitable that, if further accidents of this kind occur, public opinion will be strongly aroused. When the country realises that the use of one type of apparatus does, while the use of other types does not, involve an actual danger to life, there will be a vigorous demand for the banning of the dangerous type and a vigorous condemnation of those who run a needless risk. For the miner in the coal-mine Parliament has ordained that only certain approved patterns of safety lamp shall be used. Popular feeling, nowadays easily stirred, might insist that the processes of departmental inspection and approval should be applied also to the preliminaries of surgical operation. Meanwhile voluntary action can forestall the requirement of statutory compulsion. Hospitals and anæsthetists would do well forthwith to discard apparatus which contains the possibility of a mistake involving appalling consequences and adopt a type which does not offer this opportunity to human fallibility.

THE GRANULES OF THE TUBERCLE BACILLUS.

SINCE the time of Koch every worker in the field of bacteriology has been conversant with the fine darkly-stained violet granules which are found in the tubercle bacillus when treated by the Ziehl-Neelsen method. To these Carl Spengler added his "splitter" bodies, and in more recent times Hans Much described the various forms of granular dust which are known by his name. In a series of photomicrographs taken with a 1/18th-inch immersion lens, Dr. W. C. Minchin[1] claims that he can detect in tubercle cultures the phenomena of division, budding, and protrusion of tubes, from which can be deduced a definite life-cycle. The pictures are suggestive, although it is generally agreed that morphology, unsupported by other evidence, offers pitfalls to the unwary. Dr. H. C. Sweany,[2] of Chicago, has endeavoured to carry the subject a step further by a careful study of the life-history of the tubercle bacillus. He describes various types of granules, with illustrative drawings both in line and water-colour. But all this work has brought us little nearer than Koch was to the solution of the question: What are these granules? It is essential that any theory should have cogent reasons for its proposition. Dr. Sweany gets down to basic principles. If these granules are part of the life-cycle of the tubercle bacillus they follow presumably the biological laws which govern bacterial life. One of the characteristics which makes it impossible at present to reconcile the granules with any ordinary life-cycle is the random nature of the changes. At one time the appearances suggest atavistic change, at another the remnant of a regular cycle. Time was when all these changes were considered to be valuable in diagnosis and prognosis—a point on which Dr. Minchin still lays stress. For the moment this aspect seems to us less important than is the possible relationship of the granules to the suggested transformation of para-tubercle bacilli into true tubercle bacilli and to the so-called filter-passing virus. Both these points have been raised by the work of continental writers. Before accepting their conclusions it must be certain that they are dealing with comparable material. It is only necessary to hand out to a class the same specimen of tuberculous pus in order to realise how variable may be the morphological appearances presented in the microscopic field. The personal factor of the worker is of no small importance. Meanwhile it is possible that a more vigorous pursuit of the other acid-fast bacilli in nature may yield valuable information.

THE CAUSATION OF LICHEN PLANUS.

THE ætiology of lichen planus has exercised the minds of dermatologists since the days of Hebra, and many and various have been the suggestions made. Dr. S. Neumark,[3] after a careful summary of the literature, supports the most recent, and yet by no means novel, view that the eruption is the direct or indirect result of shock—psychical or toxic—on

[1] A Study in Tubercle Virus. By W. C. Minchin. London: Baillière, Tindall and Cox. 1927. Pp. 110. 25s.
[2] Amer. Rev. Tub., 1928, xvii., 52.
[3] Dermat. Woch., 1928, lxxxvi., 1666.

ie nervous system. The present theory expands nd improves on an older one by specifying the mpathetic or vegetative neurons and their conexions as the actual neurological paths in the iechanism by which lichen planus is produced. he evidence in favour of this hypothesis is drawn iostly from the literature, but we are reminded that evere emotional states are often the prelude to an ttack, that highly strung and unstable persons are he most frequent victims, and that general shock s always associated with disturbance of the symathetic system. On the more narrow dermatological ide it may be noted that lichen planus is very often pigmentary affection, that it sometimes occurs ith vitiligo, and that in more than one case it has ollowed administration of thallium acetate. Some upport for the theory is also forthcoming on the herapeutic side. Lumbar puncture, as is well known, nay have a curative effect in the acute generalised ase, and, according to Margarot, it exercises a owerful stimulus on the parasympathetic as evidenced y immediate slowing of the pulse and a fall in blood ressure. Ignoring the effects of neosalvarsan—well ecognised as disturbing the sympathetic nervous ystem—both in the production and control of ichenoid eruptions, we are next invited to consider he effects of radiotherapy administered in the nterscapular and lumbar regions. This often has xcellent results in severe cases of lichen planus, hough sometimes it may seriously aggravate the ondition. Neumark thinks it may be assumed with air certainty that the results so obtained are dependent on the direct action of the rays on the sympathetic ganglia at the sides of the vertebral column, and the subsequent hyperidrosis, localised to these areas, is suggestive of such a specific action. He concludes his interesting deductions with a report of investigations he undertook with the object of supporting the thesis from the biochemical point of view. In ten cases of the disease treated with X rays it was found that the blood-sugar of the fasting patient after having been somewhat raised fell quite definitely after the case had been cured or alleviated by the treatment. A similar investigation of the cholesterin and uric acid content of the blood gave similar results. It is admitted that the number of cases so investigated is too small for any conclusions, but so far as this evidence goes it further supports the view that in lichen planus we have an example of sympathetic reaction comparable to that which is regarded as responsible for the initiation of herpes zoster.

DURING 1928 the Royal Medical Benevolent Fund has made 457 grants amounting to £8621. This sum is £1456 in excess of that for the year 1927. Annuities totalling £4970 have been given to 185 persons, the average amount of these annuities being £10 per annum. Owing to a recent legacy, however, the Fund has been able to grant six annuities of £100 each. An increase of £1456 on the grant account is very heavy and necessitates an urgent appeal that subscriptions and donations in 1929 will not only be maintained but very greatly increased, so that the Fund may extend its work as well as continue to help those already on its books. Contributions should be sent to the Hon. Treasurer at 11, Chandos-street, Cavendish-square, London, W. 1.

UNIVERSITY OF LONDON.—At a meeting of the Senate on Dec. 19th the degree of Doctor of Science was conferred on Dr. Major Greenwood, F.R.S., professor of epidemiology and vital statistics in the University, for a thesis on the Laws of Mortality from a Biological Point of View.

It was reported that the Rhodes Trustees have given £500 for the fund being raised to build a Hall of Residence for Overseas and British Students and that they had provisionally decided to set aside a similar sum towards the building of a Students' Union on the Bloomsbury site.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XVI.

THE CHEMICAL EXAMINATION OF FÆCES.

BY J. H. RYFFEL, B.SC. LOND., B.CHIR. CAMB.,
CLINICAL CHEMIST, GUY'S HOSPITAL.

THE chemical examinations of fæces that can be usefully employed are not many, but may be of great importance in suitable cases. Unless a determination of fat is required, the specimen tubes 2½ inches long usually employed are sufficient, and there are no special precautions to be employed in the collection of a specimen except where dieting is necessary (see below).

Blood.

The value of looking for blood in fæces is not universally accepted. If it is to yield useful results, unless the amount of blood is large enough to give the spectrum of acid hæmatin on extraction, it is quite essential to diet the patient for four days preliminary to examination. No device for diminishing the sensitiveness of the tests will exclude the effect of diet, unless the sensitiveness is so reduced as not to give reliable results. The diet given must be free from hæmoglobin and from chlorophyll—i.e., it must not include meat, fish, or meat extracts, green vegetables or coloured fruits. Potatoes, eggs, and vegetable substitutes for meat extracts are allowable. A useful device is to give a dose of charcoal when starting the diet, and to wait until the charcoal has disappeared from the fæces before the specimen is collected. A criticism often made is that there is no indication from which part of the intestinal canal the blood comes from. This is not absolutely true, since, for example, blood from hæmorrhoids will not show hæmatoporphyrin, but there is certainly no essential difference detectable between the results of bleeding from the colon and from the stomach, and bleeding from the mouth or gums has to be rigidly excluded as a possible source of error. The most valuable examination consists in extracting the fæces with glacial acetic acid and ether, water being added to cause the ether to separate. Part of the ethereal extract can then be used for the *benzidine* or the *guaiac* test. The remainder is mixed with diluted hydrochloric acid and allowed to separate, which it does immediately. The spectra of acid hæmatin and of chlorophyll can then be recognised in the upper or ether layer, while acid hæmatoporphyrin is seen in the watery layer. Stercobilin is found in both layers. Chlorophyll is mainly useful in that it shows that dieting has been inadequate. A visible spectrum of acid hæmatin signifies the presence of a large amount of blood. When this is not visible, a positive guaiac or benzidine test signifies the presence of acid hæmatin in quantity insufficient to show a spectrum.

Hæmatoporphyrin does not give the guaiac or the benzidine test. Its presence, detectable in a spectrum, shows that the blood has undergone change. To what extent this change takes place depends on the source of blood, on the individual, and on the substances in the gut at the time. Examination of the spectrum is complementary to the guaiac test. Some cases are met with who show hæmatoporphyrin only, although definite bleeding is known to occur; on the other hand, if much bismuth and other carbonates are given in the course of the treatment of gastric or duodenal ulcer, the fæces frequently show a positive guaiac test and no hæmatoporphyrin. Hæmatoporphyrin may conceivably occur apart from bleeding; this has been observed in some cases of

optimum score attained by White Plains, and how 1927 compared with 1926. In the case of tuberculosis control, for example, 68 points were scored out of a possible 100. The score was "perfect" on recording, on nurses' visits to cases, on follow-up of post-sanatorium cases, and on days of hospitalisation, but the clinic patients evidently did not present themselves to the clinic as promptly as they should since too few cases were discovered in the incipient stage, and there was wholly inadequate provision for open-air class-rooms, preventoria, and day camps. Popular health instruction in White Plains was shown at a glance to be much below standard, only nine out of a possible 20 points being scored in this field. Points were lost because no health bulletin was published, no use was made of motion pictures on health, and public lectures on health were but half as numerous as they should be, according to the standard set up by the American Public Health Association. On the other hand, the maximal number of points was scored as far as educational health pamphlets and newspaper publicity were concerned. Medical officers of health with a due sense of decorum and a conviction that public health is a matter within the competence of none but themselves, may perhaps find such methods as those just described more suited to a stock-taking grocer than a scientist. But there is much to be said for the medical officer of health who is willing to submit to the fierce light of publicity—to go back, as it were, to school, there to have his work examined and allotted so many marks, good or bad. The question is, do such methods promote efficiency?

THE DANGEROUS JUNKER.

FATALITIES have sometimes been caused by the pumping of liquid chloroform, instead of vapour, out of a Junker's apparatus into an unconscious patient. This is an accident in anæsthetic administration which should no longer be possible. At an inquest on a patient who died from this cause the hospital authorities are said to have stated recently that "if the apparatus could be improved in any way or better apparatus could be found" they would adopt the safe instrument. It should be known to all institutions and anæsthetists that there are several forms of Junker apparatus which are practically foolproof. For the convenience of our readers these are described and illustrated on p. 1359. Much more important, however, than the form of apparatus, is it for every administrator of anæsthetics to abide by the golden rule—never to use an apparatus without first trying it. This is the only safe way with machines, and now that machinery has invaded so largely the technique of administration of anæsthetics it is an unforgivable fault to take machinery for granted. Machines are good servants, but bad masters. If the administrator leaves safety to the apparatus, he is putting the machine in the place that should be occupied by his own skill, care, and intelligence. There has been produced, we understand, a sort of Robot anæsthetist. We can imagine no more perilous invention. The safety of those to whom a poison is being administered for any purpose must depend on the instructed care of the individual responsible for the dose. If he cannot understand, foresee, and correct the vagaries of unconscious patients' behaviour, disaster may occur. Machinery requires not less but more skill on the part of the anæsthetist than simpler methods. His first duty must always be to test his apparatus.

The coroner's jury at the inquest referred to above returned a verdict of death by misadventure and exonerated the anæsthetist, and a favourable finding by a coroner's jury is reasonably conclusive. It is, however, inevitable that, if further accidents of this kind occur, public opinion will be strongly aroused. When the country realises that the use of one type of apparatus does, while the use of other types does not, involve an actual danger to life, there will be a vigorous demand for the banning of the dangerous type and a vigorous condemnation of those who run a needless risk. For the miner in the coal-mine Parliament has ordained that only certain approved patterns of safety lamp shall be used. Popular feeling, nowadays easily stirred, might insist that the processes of departmental inspection and approval should be applied also to the preliminaries of surgical operation. Meanwhile voluntary action can forestall the requirement of statutory compulsion. Hospitals and anæsthetists would do well forthwith to discard apparatus which contains the possibility of a mistake involving appalling consequences and adopt a type which does not offer this opportunity to human fallibility.

THE GRANULES OF THE TUBERCLE BACILLUS.

SINCE the time of Koch every worker in the field of bacteriology has been conversant with the fine darkly-stained violet granules which are found in the tubercle bacillus when treated by the Ziehl-Neelsen method. To these Carl Spengler added his "splitter" bodies, and in more recent times Hans Much described the various forms of granular dust which are known by his name. In a series of photomicrographs taken with a 1/18th-inch immersion lens, Dr. W. C. Minchin[1] claims that he can detect in tubercle cultures the phenomena of division, budding, and protrusion of tubes, from which can be deduced a definite life-cycle. The pictures are suggestive, although it is generally agreed that morphology, unsupported by other evidence, offers pitfalls to the unwary. Dr. H. C. Sweany,[2] of Chicago, has endeavoured to carry the subject a step further by a careful study of the life-history of the tubercle bacillus. He describes various types of granules, with illustrative drawings both in line and water-colour. But all this work has brought us little nearer than Koch was to the solution of the question: What are these granules? It is essential that any theory should have cogent reasons for its proposition. Dr. Sweany gets down to basic principles. If these granules are part of the life-cycle of the tubercle bacillus they follow presumably the biological laws which govern bacterial life. One of the characteristics which makes it impossible at present to reconcile the granules with any ordinary life-cycle is the random nature of the changes. At one time the appearances suggest atavistic change, at another the remnant of a regular cycle. Time was when all these changes were considered to be valuable in diagnosis and prognosis—a point on which Dr. Minchin still lays stress. For the moment this aspect seems to us less important than is the possible relationship of the granules to the suggested transformation of para-tubercle bacilli into true tubercle bacilli and to the so-called filter-passing virus. Both these points have been raised by the work of continental writers. Before accepting their conclusions it must be certain that they are dealing with comparable material. It is only necessary to hand out to a class the same specimen of tuberculous pus in order to realise how variable may be the morphological appearances presented in the microscopic field. The personal factor of the worker is of no small importance. Meanwhile it is possible that a more vigorous pursuit of the other acid-fast bacilli in nature may yield valuable information.

THE CAUSATION OF LICHEN PLANUS.

THE ætiology of lichen planus has exercised the minds of dermatologists since the days of Hebra, and many and various have been the suggestions made. Dr. S. Neumark,[3] after a careful summary of the literature, supports the most recent, and yet by no means novel, view that the eruption is the direct or indirect result of shock—psychical or toxic—on

[1] A Study in Tubercle Virus. By W. C. Minchin. London: Baillière, Tindall and Cox. 1927. Pp. 110. 25s.
[2] Amer. Rev. Tub., 1928, xvii., 52.
[3] Dermat. Woch., 1928, lxxxvi., 1066.

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Letter from the Prince of Wales.

Although I am back in England, I cannot just at present undertake any public engagements. I should be grateful, therefore, if you and Mr. Whitley and the Governor of the Bank of England would continue to act as President's Powers Committee until the end of the year, and I would ask you to tell the council how sorry I am not to be able to take the chair at the distribution meeting on Dec. 14th. I congratulate King Edward's Hospital Fund on the achievements of a year which has seen the completion of the Wells Legacies distribution, the issue of the Pay Beds report, the actual start of the contributory pensions scheme for nurses and hospital officers, the receipt of Sir Otto Beit's magnificent gift for the purchase of radium, and the attainment for the first time of an ordinary distribution of a quarter of a million. I approve the proposal to appoint a special committee to consider the position of the voluntary hospitals under the Local Government Bill, and I wish the King's Fund and the hospitals all possible prosperity in the coming year.

Lord Hailsham then moved from the chair:—

"The General Council of King Edward's Hospital Fund for London desire to express their profound sympathy with His Majesty the King, Patron and Past President of the Fund, in his illness, and their heartfelt wishes for a speedy and complete recovery. They desire also to convey with their humble obedient duty to Her Majesty the Queen, His Royal Highness the Prince of Wales, President of the Fund, and the other members of the Royal Family an expression of sympathy in their prolonged anxiety."

The resolution was seconded by the Rt. Hon. J. H. Whitley and carried unanimously.

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Continuing, Lord Hailsham, after referring to the gift of £50,000 from Sir Otto Beit for the purchase of radium, said the annual distribution this year constituted in itself a great landmark in the history of the Fund, for it was the first time that the ordinary annual distribution had reached the total of a quarter of a million. In order merely to maintain the £250,000 the Fund had to receive during the year at least £90,000. This year's success had been largely due to some special donations: notably two of £10,000 each from two anonymous donors, one of whom had now helped them with gifts of varying amounts for six years running. This did not include Mr. J. J. Crosfield's gift of £10,000 to capital. The Fund had also received an exceptional amount in legacies during the year. Besides the £250,000 in ordinary grants to maintenance and building the list contained the first instalments of the special grants promised in aid of the contributory pension scheme for nurses and hospital officers. This scheme, which the Fund initiated, had now been adopted by 93 hospitals in London and by 58 hospitals in other parts of the country, making 151 in all with a total of nearly 21,000 beds, which was practically one-third of all the voluntary hospital beds in Great Britain and Northern Ireland. If these special grants were included, and also the final grants made last May out of the Wells legacies, the grand total distributed during this year would be no less than £290,000. The publication in July of the report of the Pay Beds Committee had been one of the principal items in the Fund's work. The transfer to the county councils of the infirmaries hitherto carried on under the poor-law would produce great changes in the hospital service, and it was hoped that great improvements would result. But it would be necessary to work out a scheme by which the voluntary hospitals should continue to make their special contribution to that hospital service, which depended on the fact that both their management and their finance were voluntary. If the voluntary hospitals were not preserved, not only would huge additional sums have to come out of the rates, but the present spirit of the voluntary hospitals, which influenced all other hospitals in this country, would be lost and the whole system would become official. This was the last thing that was desired.

Hon. Treasurer's Statement.

Lord Revelstoke (hon. treasurer) said that last year the estimates enabled the Management Committee to recommend a distribution of £245,000. The League of Mercy contributed an additional £2000, thereby increasing the total to £247,000. In addition to the donation of £10,000 from Mr. J. J. Crosfield, receipts on capital account included a legacy of £3709 from Miss E. A. Marshall, and further sums of £2671 and £1500 from the estates of Sir Julius Wernher and Mr. Samuel Lewis, these two sums being additional to the very large amounts already received from these sources. Miss Marshall's legacy, in accordance with the provisions of her will, would be added to the "family fund" entitled the "Marshall Fund." This fund was established by her brother, Mr. H. W. Marshall, who inaugurated it by a gift of £10,000 3½ per cent. Conversion Stock last year, on the occasion of the luncheon at the Mansion House held to commemorate the thirtieth anniversary of the King's Fund. This was the first "family fund" to appear in the annual report, and it now amounted to £11,334, the whole of this sum being represented by permanent investments. It was interesting to note that, had it not been for the interest on the late Lord Iveagh's bequest of £60,000 received in 1927, the estimates in November, which computed legacies on the basis of the five years' average, would not have reached the £250,000, but would barely have exceeded last year's total of £247,000.

The League of Mercy.

Lord Marshall, in making the annual statement on behalf of the League of Mercy, announced that this year it was proposed to allocate £17,000 to the King's Fund. This was the same amount as the grant of last year, which was £2000 higher than that of the year before. Its grants this year to extra-metropolitan hospitals amounted to £8210. From the inauguration of the League in 1899 it had transferred to the King's Fund from its collections for hospitals a total of £432,034, and had made grants to hospitals outside London totalling £108,907, making a grand total of £540,941.

Grants to Hospitals and Convalescent Homes.

The Chairman of the Distribution Committee (Sir Cooper Perry) presented the report of the Committee on the Distribution to Hospitals (including recovery and convalescent branches), which stated that the amount placed at the disposal of the Distribution Committee for allocation amongst hospitals and their recovery and convalescent branches at the present distribution was £248,000, as against £245,000 last year. The number of hospitals applying for grants was 141, the same number as in 1927—Ormond Maternity Home having dropped out of the list and an application having been received from Wembley Hospital, opened in June last. The Committee were pleased to see, from the King's Fund Statistical Report, that the steady progress of the hospitals was resumed in 1927 after a slight interruption in 1926, the first since 1922. Each of the main sources of revenue—voluntary gifts, receipts on account of services rendered, income from investments and legacies—showed an increase. The combined result, for all the participating hospitals taken together, was a small excess of income over expenditure, although there were still 56 hospitals with deficits for the year, some of them serious. The increase in the grants

hæmatoporphyrinæmia. Hæmatoporphyrin is also found in meconium, but generally speaking hæmatoporphyrin in fæces in recognisable quantity signifies bleeding and nothing else. The significance of the results in various conditions demands some comment. In acute ulcerative colitis red cells are seen and the spectrum of acid hæmatin alone obtained, but when there is less diarrhœa in a milder case the blood is often completely laked and hæmatoporphyrin appears. Malignant growths anywhere in the alimentary canal show hæmatoporphyrin, often with a visible spectrum of acid hæmatin, with a tendency for the hæmatoporphyrin to be more marked the higher the situation of the growth. Provided there is some ulceration the bleeding from growths is both characteristic and persistent. Blood from other sources than growths shows the same relationships with the proviso that, where the amount of blood is large, acid hæmatin is the more conspicuous.

To illustrate the changes that occur we may take the case of hæmatemesis from a gastric ulcer. This is rapidly followed by melæna, a large amount of acid hæmatin being shown by the fæcal extract. As the bleeding gets less the hæmatin diminishes and hæmatoporphyrin increases. Finally, when bleeding ceases completely, hæmatoporphyrin is the last abnormality to disappear.

Ulcers of the body of the stomach are remarkably variable in their bleeding. Thus with a well-marked ulcer there may be no bleeding on one occasion followed shortly afterwards by melæna. Ulcers near the pylorus bleed more consistently, especially if there is any pyloric obstruction. Duodenal ulcers are also variable, but rather in the sense that some types of duodenal ulcer with definite pain do not bleed, or scarcely so, while others, even with little pain, bleed persistently. In this type of ulcer during treatment blood may still be found in the fæces long after all other symptoms have disappeared.

Bile.

Stercobilin can be recognised by its absorption spectrum after extraction. If it is completely, or nearly completely, absent, complete biliary obstruction can be diagnosed. Stercobilin may be practically absent for a short period in catarrhal jaundice, but generally in this disease some stercobilin is present. This is notably so in spirochætal jaundice, where stercobilin is not appreciably diminished. Fatty stools are lightly coloured, not only owing to the admixture of fatty bodies, but the stercobilin is often small in amount irrespective of biliary obstruction. The reason for this is not obvious. Where there is diarrhœa the transformation of bile pigment to stercobilin may be incomplete, so that bile pigment is found as well as stercobilin. In infants the principal pigment is bile pigment, not stercobilin, the change to the latter pigment being only gradually established during the first year of life.

Fatty Substances.

In biliary deficiency the fats in the food are split to fatty acids and glycerine, but the fatty acids are not absorbed. They appear in the fæces mainly as soaps, crystals of which can be recognised under the microscope. The reaction of the fæces is not usually acid. Where there is failure to split the fats, fatty globules can be recognised microscopically, and the reaction of the fæces is often acid. Causes of such failure are pancreatic deficiency and gastro-colic or jejuno-colic fistula. It is of the utmost importance in such cases to eliminate the possibility of the presence of liquid paraffin, as this will appear as fatty globules and also vitiate determinations of neutral fat. In sprue, in cœliac disease, and in obstruction of the lymphatics of the mesentery the fat of the food is split but not absorbed, and appears as soaps usually recognisable in crystalline form. Infants are especially liable to failure in absorption of fat. The stools are acid and fat globules are easily recognised. This condition is often temporary and may be easily dealt with by dieting.

Determinations of Fat and Fatty Acids.—The total fat and fatty acid in the fæces is determined by extraction in a Soxhlet apparatus after the fæces have been mixed with 1 per cent. hydrochloric acid in alcohol and evaporated to dryness. The extract obtained is then filtered, evaporated, and weighed. It includes some pigment, cholesterol, &c., but these are small in weight and are neglected. If the process is repeated without the addition of hydrochloric acid, the difference between the two results expressed as percentages gives the amount of fatty acid present as soaps. Finally, if the second extract be dissolved in alcohol and ether and titrated with alcoholic potash using phenolphthalein as indicator, a figure is obtained which represents the free fatty acids. Multiplying the number of c.cm. of N/10 potash used by 0·0284 gives the fatty acid present expressed as stearic acid. If this figure is subtracted from the weight of the second extract the difference represents what is called the neutral fat, which, however, includes cholesterol, and also paraffin, if present. A more correct method would be to digest the neutralised second extract with alcoholic potash until the neutral fat was hydrolysed, and then to titrate with acid to neutrality to determine how much potash had been neutralised by the liberated acid. Cammidge employs Schmidt-Werner milk tubes for extraction instead of the Soxhlet apparatus, thereby saving a considerable amount of time. In the dry fæces the normal figures are:—

	Per cent.	
Total fat and fatty acid	15 to 25	
Neutral fat	1 to 2	U.F.A.
Free fatty acid	9 to 13	U.F.A.
Fatty acids as soaps	10 to 15	

U.F.A. = Unsoaped fatty acids, 10 to 15 per cent.

The fatty acids as soaps and the free fatty acids plus neutral fat are normally about equal, while the free fatty acid is about nine times as much as the neutral fat. If these determinations are done on the fæces of a case with deficient fat absorption these ratios are disturbed. Thus where there is pancreatic deficiency the neutral fat may be as high as 15 per cent. and equal in amount to the free fatty acid. Biliary deficiency alone gives high soaps and high free fatty acids without appreciably increasing the neutral fat, while pancreatic deficiency (or gastro-colic fistula) is shown by a relatively high neutral fat, the free fatty acid figure being also high in relation to the soaps, as the stools are generally acid in these conditions.

Meat Fibres.

Remnants of muscle fibres are normally seen when meat or fish is taken in sufficient quantity. When the fibres are more numerous, larger and show cross striation, there is some failure in digestion, probably due to lack of trypsin, which often accompanies failure in fat digestion. The excess of unabsorbed fat may also impede digestion of meat. Occasionally over use of liquid paraffin results in excess of meat fibres in the stools, and sometimes meat fibres are found in excess in diarrhœa as a result of intestinal hurry.

Starch.

In a well-marked case of failure to absorb starch the fæces are acid in reaction, and starch grains, especially those in vegetable cells such as those of potato, are easily recognised microscopically on the addition of iodine. The fæces can also be incubated with water and the gas evolved measured. If actual starch grains are not seen, potato cells may be found occupied by iodophil yeasts. Failure to absorb starch in full amount may be an individual peculiarity resulting in diarrhœa and flatulence, when it is easily dealt with by diminishing the amount of starch in the food, especially the vegetable forms such as potato. Otherwise starch signifies pancreatic deficiency and is concomitant with, though less frequent than, failure to digest fat.

A number of other chemical examinations of fæces have been proposed, such as determinations of diastase and of trypsin, but they have not, in my view, been sufficiently developed to be of diagnostic value.

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Lord Marshall, in making the annual statement on behalf of the League of Mercy, announced that this year it was proposed to allocate £17,000 to the King's Fund. This was the same amount as the grant of last year, which was £2000 higher than that of the year before. Its grants this year to extra-metropolitan hospitals amounted to £8210. From the inauguration of the League in 1899 it had transferred to the King's Fund from its collections for hospitals a total of £432,034, and had made grants to hospitals outside London totalling £108,907, making a grand total of £540,941.

Grants to Hospitals and Convalescent Homes.

The Chairman of the Distribution Committee (Sir Cooper Perry) presented the report of the Committee on the Distribution to Hospitals (including recovery and convalescent branches), which stated that the amount placed at the disposal of the Distribution Committee for allocation amongst hospitals and their recovery and convalescent branches at the present distribution was £248,000, as against £245,000 last year. The number of hospitals applying for grants was 141, the same number as in 1927—Ormond Maternity Home having dropped out of the list and an application having been received from Wembley Hospital, opened in June last. The Committee were pleased to see, from the King's Fund Statistical Report, that the steady progress of the hospitals was resumed in 1927 after a slight interruption in 1926, the first since 1922. Each of the main sources of revenue—voluntary gifts, receipts on account of services rendered, income from investments and legacies—showed an increase. The combined result, for all the participating hospitals taken together, w a small excess of income over expenditure, alt there were still 56 hospitals with deficits for some o them serious. The increase in

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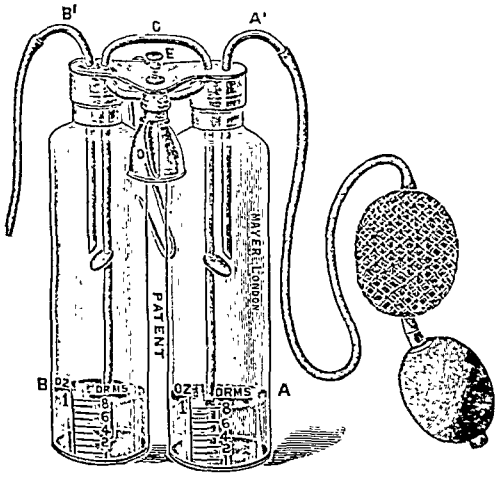

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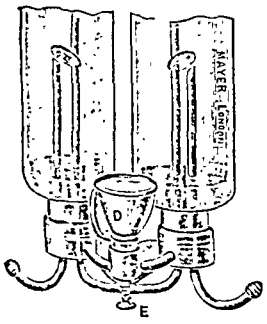

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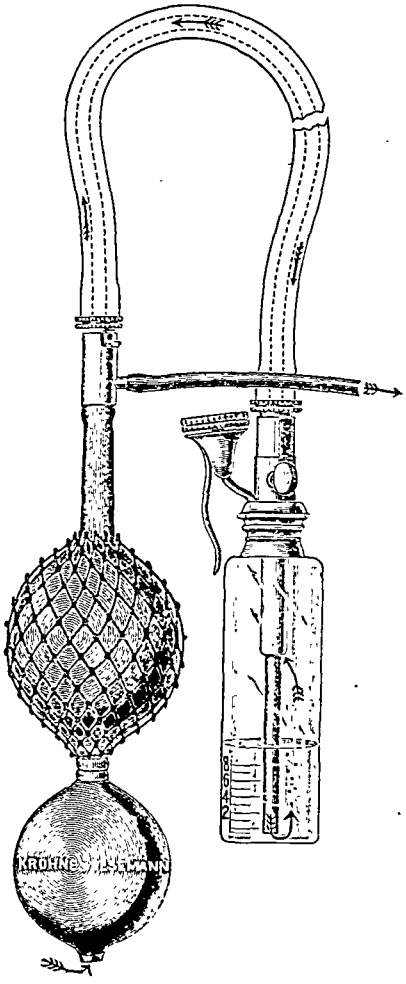

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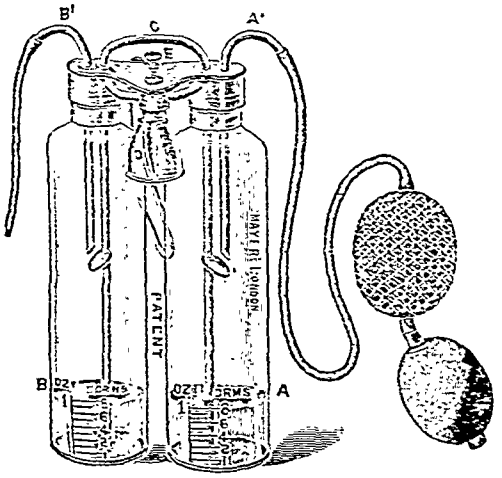

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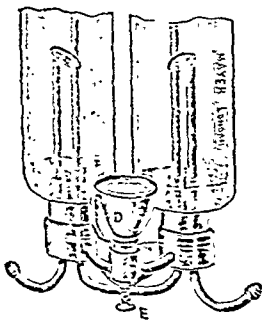

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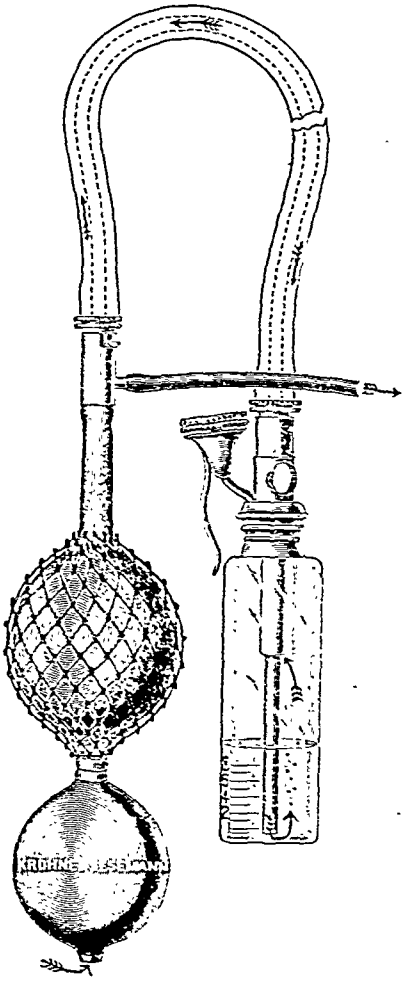

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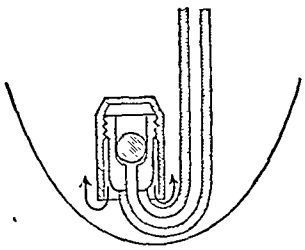
THE RIGBY MODIFICATION.

(DOWN BROS., LTD., 21–23, ST. THOMAS'S-STREET, LONDON, S.E. 1.)

THE device introduced by Dr. Morris Rigby, of Brighton, makes it impossible to expel the contents of the bottle through the inlet tube, which is provided with a ball-valve at the end inside the bottle (Fig. 5). The top of the valve is a sieve which breaks up the air stream into a spray, which is deflected downward by a hood, thus preventing the chloroform from splashing into the exit tube. The valve is simple, it cannot get out of order, and it does away completely with the danger from wrongly attaching the tubes. Messrs. Down Bros. do not stock or sell any form of Junker or Junker-Buxton inhaler which is not fitted with this ball-valve. The price of the chloroform inhaler, complete in case, is £3 8*s*. 3*d*., that of the chloroform bottle only, £1 5*s*. The extra cost of the valve fitted to customer's own chloroform bottle is 4*s*.

FIG. 5.

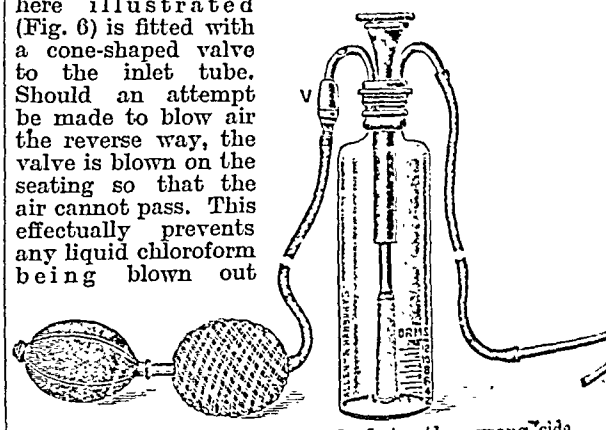


MAJOR ROUTH'S MODIFICATION.

(ALLEN AND HANBURYS, LTD., 48, WIGMORE-STREET, LONDON, W. 1.)

THIS firm has for some time past discontinued the manufacture of Junker apparatus without a safety device. Major L. M. Routh's apparatus here illustrated (Fig. 6) is fitted with a cone-shaped valve to the inlet tube. Should an attempt be made to blow air the reverse way, the valve is blown on the seating so that the air cannot pass. This effectually prevents any liquid chloroform being blown out should the bellows be attached to the wrong side. The price of the apparatus is 35*s*. complete.

FIG. 6.



BERLIN.

(FROM OUR OWN CORRESPONDENT.)

The Ætiology of Yellow Fever.

Prof. Max Kuczynski, of the Pathological Institute of Berlin University, recently read a paper before the Society for Internal Medicine on the ætiology of yellow fever. In his own experiments on the transmission of the disease to West African monkeys he had, he said, used the *Macacus cynomolgus* species whilst Stokes had employed *M. rhesus*. During these experiments both his assistant and himself had caught a disease showing all the symptoms of yellow fever. In monkeys as well as in the human species there was first a stage of bacteriæmia, followed by a functional collapse of the liver, which, like the spleen and kidneys, became swollen and fatty. Microscopical investigation showed a central necrosis of the hepatic lobules. It was now clear, said Kuczynski, that Noguchi's leptospira was not responsible for the disease. The true cause was a coccoid organism, growing in special nutrient media whose composition would be described later. This organism had a characteristic smell, which was noticeable in patients suffering from the disease, and it could be discovered in and cultivated from all the organs. By means of old and weakened cultures immunisation could be obtained. It was rather difficult to isolate because in monkeys vibrios were present which also grew rapidly in certain media. Prof. Jungmann said he had had Kuczynski and his assistant under observation in his hospital during their illness which clinically corresponded to yellow fever. There were two stages: in the first five days the symptoms were continuous fever, painful swelling of the liver, myasthenia, albuminuria, and a typical fœtor from the mouth, resembling that of foul meat. In the second stage the pulse and temperature were sinking, there was severe vomiting, redness of the skin, and extreme paralysis of the vessels. Jaundice was in both cases very slight, but there was leucopenia and an increase in the number of erythrocytes and in hæmoglobin. The treatment consisted of carbohydrates as food and injections of insulin and glucose. To spare the liver fatty food, albuminates, narcotics, and alcohol must, he said, be avoided.

Trouble in Hanover.

In Göttingen, Hanover, a child was brought by his mother to a medical man for an operation on the tonsils. As the boy could not be induced to open his mouth the doctor smacked his face so that he should begin to cry and thus involuntarily give a view of the throat. The procedure had to be repeated, and the result was that the face showed bruises and the right eye was swollen. Being prosecuted for causing bodily injury the doctor was found not guilty on the ground that the child's mother had agreed to an operation and this meant that he was authorised to take all measures which would facilitate it. The prosecution appealed to the High Court which annulled the judgment, however, because it did not regard smacking as a recognised technical method of inducing a patient to open his mouth, other means being available for the purpose. (In fact the child had opened his mouth for only a few seconds and then had closed it again.) The defendant was found guilty of assault but was fined only M.10 as he had not acted out of roughness but only by error of judgment. The *Vereinsblatt*, the official organ of the Ärztevereins-Bund, agreeing with this decision, points out that there is no justification for the defendant's plea that smacks are allowed to facilitate certain operations. General acceptance of this view, it considers, would be detrimental to the good repute of the medical profession.

The Health of German Post-office Workers.

The Postmaster-General has issued regulations for the welfare of the numerous officials and employees of the Post-office. Old and unhealthy premises are to be rebuilt and also the official lodgings. The hours of service of the individual workers are to be regulated so as to allow enough leisure and playing grounds are to be put at their disposal. The regulations refer to the gymnastic exercises introduced some time ago with great success for telephone operators who cannot move for hours during their service. This system is to be introduced in other branches of the service where similar conditions of work exist. To tuberculous officials and employees not belonging to sick clubs a sum of M.500,000 (£25,000) is allotted to pay the costs of a stay in a sanatorium. After their discharge from the sanatorium they must be given posts where their work

is not too strenuous, and if necessary they must be transferred to a place with a better climate.

Maternity Homes and Hospitals.

The Prussian Statistical Office states that in 1926 there were in Prussia 135 maternity hospitals and similar institutions, having a total of 5101 beds. Of the 771,000 births registered, 12·4 per cent. took place in such places, as compared with 9·8 per cent. in the preceding year. This shows that an increasing proportion of women prefer to be confined in a hospital rather than in their home, a fact which from a hygienic point of view must be welcomed although it is disadvantageous to the individual practitioner. The number of cases of puerperal sepsis in these institutions was 234, with a mortality of 39·9 per cent.

During the same year in Prussia 939 accidents with electricity were reported, in about two-thirds of which the current was an alternating one. The number of fatalities was 112, and all but one of these were caused by an alternating current. In the exceptional case death was due not to the effect of the current itself on the body but to the severe injury which it produced by burning the clothes.

By an amendment to the Accidents Insurance Act, insurance will be extended to certain persons hitherto exempt—namely, members of fire brigades, certain classes of the staff of theatres, music-halls, and cinemas, nurses, laboratory assistants, and the medical staff of hospitals working in laboratories and radiographical institutes. Insurance against occupational diseases will henceforth include the scurvy of seamen.

Dr. Koppen, the oldest member of the German medical profession, has died in Heiligenstadt, Thuringia, at the age of 94. Some months ago, on the seventieth anniversary of his qualification, he received congratulatory communications from President Hindenburg, the Minister of Home Affairs, the Medical Faculty of Halle University, where he had graduated, and the Medical Chamber of Thuringia

The Services.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Sub.-Lt. W. McO. MacGregor to be Surg. Lt.
Probr. Surg. Sub-Lieut. T. F. Tierney to be Surg. Sub-Lt.

ROYAL ARMY MEDICAL CORPS.

Maj. and Bt. Lt.-Col. G. Ormrod to be Lt.-Col., vice Lt.-Col. C. A. J. A. Balck Foote, to ret. pay.
Capt. G. Fleming, Reg. Army Res. of Off., R.A.M.C., relinquishes his appt. under Art. 507 (*b*), Royal Warrant for Pay and Promotion.
T. G. Brown and C. A. Levy to be Temp. Lts.

TERRITORIAL ARMY.

Maj. J. Paton, having attained the age limit, retires and retains his rank, with permission to wear the prescribed uniform.
T. J. C. MacDonald and R. M. Macfarlane to be Lts.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Maj. W. Johnson, from the Active List, to be Maj.

ROYAL AIR FORCE.

Flight Lt. J. C. Osburne is promoted to the rank of Squadron Leader.
The following appointments are made: Flight Lts. E. C. K. H. Foreman to Princess Mary's R.A.F. Hospital, Halton; P. D. Barling to R.A.F. Base, Malta; L. Freeman to Basrah; J. O. Priestley to R.A.F. Depôt, Uxbridge.

INDIAN MEDICAL SERVICE.

Lt.-Col. Sir L. Rogers (ret.) is granted the temp. rank of Maj.-Gen. whilst Med. Adviser to the Sec. of State for India and President of the India Office Med. Board.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

LOCAL GOVERNMENT BILL.

Transfer of Functions of Poor-law Authorities.

ON Thursday, Dec. 13th, the House of Commons went into Committee on the Local Government Bill, Mr. JAMES HOPE, Chairman of Committees, in the chair.

On Clause 1 Mr. A. GREENWOOD moved an amendment to transfer the functions of the poor-law authorities to the other kinds of local authorities besides the counties and county boroughs. He said that the Labour Party regarded with apprehension the transfer of poor-law functions to many of the county councils of England and Wales. Owing to many serious and real difficulties the county councils were the least representative of all the local governing bodies. In the exercise of poor-law functions it was important that real authority should rest with bodies on which people drawn from the classes that were most likely to need assistance could serve. The county councils were the worst possible bodies to act as poor-law authorities. His amendment did not propose that all borough or urban district councils should carry out all poor-law functions, but only those with a population of over 20,000. Certain kinds of institutional treatment could be more efficiently administered by a combination of authorities. For that the Minister made provision in the Bill. There was some question as to where they should draw the line. It was a question whether the limit should be a population of 20,000 or 50,000. His own view was that 50,000 put the line of demarcation rather too high and would rule out from the exercise of poor-law duties many local authorities that could well and effectively carry them out. Many of these smaller authorities represented the best in our local government life and it was a blow in the face and an implied insult that in this transfer of powers they should have been overlooked and placed in a position of subordination to the county councils.

Mr. HARNEY said that he had an amendment on the Paper making the population unit 50,000 instead of 20,000, and applying the transfer to rural areas as well as urban districts and non-county boroughs. He pointed out that many non-county boroughs and towns in rural areas were larger than many of the county boroughs.

Mr. PALIN, in supporting the amendment, said that he was afraid that the clause as it stood would not merely stereotype the existing poor-law but would make it worse than it was to-day.

Mr. CHAMBERLAIN, Minister of Health, said that the two amendments, which differed in degree rather than in kind, were both serious: in fact they were so serious that if either of them were carried it would to a large extent destroy one of the principles upon which this part of the Bill was founded. Both amendments tried to stereotype, at any rate to a considerable extent, the very difficulty which the Government were endeavouring to overcome. It was quite true that in Clause 29 a distinction was made between urban districts with populations of 20,000 and those with less, and in that respect the Government were following out the recommendations of the Royal Commission. But Mr. Greenwood had overlooked the fact that the financial responsibility under Clause 29 remained with the county council, which made all the difference. Mr. Greenwood's amendment did not propose to leave the financial responsibility with the county council and simply to transfer the work of administration to districts with populations of 20,000. The amendment gave these comparatively small authorities financial responsibility, and also, of course, liability. He was quite aware that the Maclean Committee recommended that urban districts or non-county boroughs with populations of 50,000 should be converted into county boroughs, but two things had happened since then. In the first place another Royal Commission sitting much later had recommended that the figure should be raised from 50,000 to 75,000. The second point was that they now had to consider the situation in the light of the de-rating proposals. The effect of those proposals was to narrow the field which was open to local authorities for the raising of rates, and therefore a charge or liability which formerly would have been spread over the whole of the existing field of rateable value must be concentrated on a reduced rateable value after the de-rating proposals had taken effect. That was a very important point, and was alone sufficient to make it quite impossible for the Government to accept an amendment which would throw upon these bodies with their reduced rateable valuation the liabilities for poor-law administration.

Miss SUSAN LAWRENCE, in supporting the amendment, said that in her opinion it was not the de-rating proposals that would make these areas so poor; it was the altogether artificial formula of distribution which the Committee had not yet discussed. The Minister's plan of redistribution would so sap the resources of some districts that they would not be able to carry on. The Committee were obliged to ignore all consideration of the proper functions of given areas, to sacrifice all considerations of obtaining homogeneous units of local government, in order to cut and chop the local authorities so as to fit in with the scheme devised in Part VI. of the Bill.

Mr. ERNEST BROWN said he could see no logical reason, apart from the artificial finance of the Chancellor of the Exchequer, for not accepting the proposal that 50,000 and more, whether county borough, non-county borough, urban district, or rural district, should be the financially effective unit for the administration of these functions.

Lieut.-Colonel FREMANTLE said he should like to put forward the public health side of the question. It was from that point of view that the Royal Commission on the Poor-law, amongst others, very strongly went for the county area as the unit of administration. The question of the poor-law included questions of health. It was not merely institutional treatment that was concerned, but they had to deal with health on broad lines. If the Committee adopted the proposals in either of the two amendments they would eliminate very largely from the main purposes of the Bill the essential factors in several of the conditions that must be treated over a large area.

Mr. E. BROWN asked how Colonel Fremantle could justify that statement in view of the fact that Rutland, a county with 18,000 population, was to get these powers, and Cambridge, a non-county borough with 59,000 population, would not?

Lieut.-Colonel FREMANTLE said that he admitted that there was great anomalies, but Clause 39 gave power constantly and immediately to a certain extent to rectify those anomalies. From every point of view on the health side, and from many other points of view, so long as they utilised local experience wherever possible, as was done in this Bill, it was necessary to have the larger coördinating factor under the county authority.

Mr. R. RICHARDSON, who said that he had been a county councillor for 25 years and a member of a board of guardians for 22 years, gave the opinion that things would be far worse under this Bill than they were at present. The duties of the county councils were already heavy enough without having fresh ones imposed upon them.

Sir KINGSLEY WOOD (Parliamentary Secretary to the Ministry of Health) said that anyone who had given consideration to the poor-law must come to the conclusion that the real hope of the heavily burdened areas was for the area of charge to be extended.

The amendment by Mr. GREENWOOD was negatived by 218 votes to 131.

Mr. HARNEY'S amendment indicated by him in his speech was negatived by 223 votes to 133.

Mr. SIDNEY WEBB moved an amendment with the object of preventing county and county borough councils, to whom were being transferred these powers, from dealing with the able-bodied poor, that was the unemployed, under the poor-law.

Mr. CHAMBERLAIN said that Mr. Webb did not seem to make sufficient allowance for the fact that under the Bill they were transferring these duties from boards of guardians which had no powers to provide work to local authorities which had very large powers of that kind in their hands.

The amendment was negatived by 236 votes to 135, and Clause 1 was added to the Bill.

Powers to Combine Councils for Special Purposes.

On Clause 2 Miss SUSAN LAWRENCE moved to add the following proviso:—

"Provided that the Minister shall make orders for combining any two or more councils, whether councils of counties or county boroughs, covering suitable areas, for the purpose of dealing with vagrancy, and such orders shall include provisions for the suitable classification of all casuals, separating youths and mental deficients from other classes, and for ascertaining through the medium of the Employment Exchanges within the combined area the possibilities of employment."

She said that no people were so badly treated as the casuals. The food given to them was worse than any diet given in prison, except the punishment diet.

Sir D. NEWTON, while of opinion that Miss Lawrence's amendment went too far, urged the Minister of Health to see that vagrancy committees were set up which would operate over the country as a whole. It was most desirable that a uniform system of treatment should be enforced among local authorities.

Sir KINGSLEY WOOD said that the amendment would make it obligatory on the Ministry of Health to make orders combining authorities for dealing with vagrants. There was no justification for such a peremptory provision. The provisions of the Bill were preferable and more in the interests of the casuals themselves.

The amendment was negatived by 202 votes to 131.

The motion that Clause 2 stand part of the Bill was carried by 209 votes to 126.

Submission of Schemes.

On Clause 3, which provides that the county councils and county borough councils shall within six months of the passing of the Act prepare and submit to the Minister of Health schemes for the administrative arrangements for discharging the functions transferred to the councils under this part of the Bill.

Mr. G. HALL moved an amendment to provide that the rural and urban district councils should be consulted by the county councils in regard to the preparation of schemes.

Mr. CHAMBERLAIN said that he thought that if the county councils could get their schemes prepared in time many of them would send copies to the district councils to obtain their opinion before submitting them to the Ministry of Health and they would be well advised to do so. His difficulty in accepting this amendment was that it interposed another process into the various measures which had to be taken in order to bring the scheme into operation on April 1st, 1930. He would, however, be willing to move an amendment to Clause 7 making it obligatory on the county council to send a copy of their scheme to each county district in their area when they submitted it to the Minister.

In reply to Captain MACMILLAN, Sir KINGSLEY WOOD said that the minor authorities would have adequate time given to them to make any representations to the Minister before an order was made.

The amendment was negatived and the clause was added to the Bill.

Provisions as to Alternative Powers of Giving Assistance.

On Clause 4 Sir RICHARD LUCE moved an amendment, the object of which was to remove the option given to local authorities in regard to the working of certain parts of the health services and to ensure as far as possible that in future those services which could be administered under existing Acts should be so administered and not by way of poor relief. He said that he had two further amendments on the Paper dealing with the same point. He realised that they would not completely carry out the transfer of the medical services from the assistance committees unless certain further action was taken under Clause 5, but if this amendment was accepted it would leave practically nothing to be done which would not be automatically done under Clause 5 where power was given to the county councils to direct that other parts of their duties should be transferred to committees other than the assistance committees. It did not seem that the Minister was carrying out the first of his proposals completely to coördinate the medical services in the area unless this were done. The very first of the Minister's proposals two years ago was to coördinate medical effort and to concentrate it. If a large portion of the duties was to be left to the new assistance committee, which was really only taking the place of the old guardians, except, of course, that it was under a different authority, the effect would be not to divorce the medical service from the other service, although that was so necessary for the effective coördination of the medical services. The assistance committee did not seem to him to be a really suitable committee to undertake the duties which would be imposed upon it in this way. It would always have as its first duty the provision of monetary assistance to the poor in the way that the old guardians gave it. There was no doubt that one of the great failures of the guardians in the past had been the administration of the medical service. There had been, of course, notable exceptions, but on the whole, speaking from a professional point of view, one could not say that the medical services for the poor provided by the guardians had been anything like as good as those administered through voluntary hospitals, and so on. Therefore it must be admitted that it would be advantageous to transfer such duties as were concerned with medical matters—education came into it also—to those committees which were already devoting their time to and had been brought up to deal with these particular subjects in the best possible way. It was difficult to train a new committee in two distinct duties. The new assistance committee would have to be trained in the duty of medical relief. They would have to train these committees in work which other committees were already trained to perform and the work would be duplicated. Moreover, they would have a medical officer of health who was the adviser of the health committee and other committees that dealt with such matters. The medical officer would be compelled to divide his attention. Apart from that, it would be only fair to the sick poor to give them the full advantage in every way of the assistance

for the reduction in the amount of the subsidy and the reduction in their own contribution, were in a position to place orders for houses at £50 10s. less than before the cut was made. With regard to the output of houses, it had been suggested that the reduction in the subsidy had stopped building. The number of State-assisted houses completed in each quarter of 1926 before the alteration in the subsidy were: In the March quarter, 28,000; in the June quarter, 34,000; in the September quarter, 41,000; and in the December quarter, 40,000. In the March quarter of 1927 they went down to 38,000; in the June quarter they rose to 44,000; in the September quarter they rose to the tremendous figure of 90,000; and in the December quarter they dropped to 24,000. The present year had been characterised by a rapid increase in the output. In the first quarter it was comparatively small—20,000; in the June quarter it was 25,000; and in the September quarter it was up to 32,000. So that by September of this year they were within 5000 of the output of the quarter ended March, 1927. The total output in the three quarters of this year was 77,477, or nearly half as many again houses as for the whole of 1924. Taking into consideration the conditions all over the country, he had come to the conclusion that it was desirable in the present case to make the cut in the subsidy the same as it was before—that was the equivalent of £25 per house. He did not expect that as a result of this Order there would be a second fall in the price of houses to the same extent, but he was not satisfied that even now the price had reached the bottom level. But when he was told that the effect of this Order would be to raise the rent of houses he replied that those people who maintained that were wilfully shutting their eyes to the facts.

The motion approving the draft of the Order was carried by 241 votes to 146.

ROAD TRANSPORT (FIRST-AID EQUIPMENT) BILL.

In the House of Commons on Tuesday, Dec. 18th, Mr. RAMSDEN asked leave to bring in a Bill to regulate the first-aid equipment of public passenger service vehicles on roads. He said that the object of the Bill was to ensure that on all public passenger vehicles such as motor omnibuses and chars-a-banc there should be carried a first-aid outfit and that there should be someone on the vehicle competent to use it. The Bill would not apply to railway carriages, tramways, or trolley vehicles. The regulation as to the outfit and by when it should be carried would be left to the Minister of Transport.

[Leave was given to introduce the Bill, and it was read a first time. Dr. DRUMMOND SHIELS was one of the backers of the Bill.]

GOVERNMENT AND DISTRESSED AREAS.

In the House of Commons on Thursday, Dec. 20th, the Supplementary Estimate for £295,625, including £155,000 as a grant-in-aid of the Lord Mayor's Fund for transference of unemployed workpeople and £20,000 for distressed mining areas in Scotland, was considered on report.

Mr. BALDWIN (Prime Minister) said neither the present nor any Government could do anything without the help of the community. The whole community more than ever was required to help in this matter of the distressed areas, and the most effective way in which the community could help was for employers to take in someone, if only one man, who came from those areas where he would never get employment and get him into a district where he could hope to get it. With the exception of the black spots the country as a whole was prosperous. It was perfectly obvious when they came to consider for a moment the grant-in-aid towards the Lord Mayor's Fund that now that the Government had made a contribution towards that fund it was quite impossible any more to draw any distinction between any classes of workers as far as relief was concerned inside a distressed mining area.

After considerable debate the report of the vote was agreed to.

CHRISTMAS ADJOURNMENT.

The House of Lords adjourned for the Christmas recess on Wednesday, Dec. 19th, until January 22nd. The House of Commons adjourned on Thursday, Dec. 20th, until January 22nd.

HOUSE OF LORDS.

WEDNESDAY, DEC. 12TH.

ROAD VEHICLES REGULATION BILL.

Viscount CECIL OF CHELWOOD moved the second reading of the Road Vehicles Regulation Bill, which requires all drivers to take out a licence after examination into their skill and physical fitness, and all motor vehicles to be provided with a mechanical check on their speed. He said that more than 5000 persons were killed every year through accidents on the roads—the immense majority of them by motor vehicles. In addition 150,000 were injured every year and it was calculated that not less than 300,000 accidents to persons or property occurred on the roads every year. Four-fifths of these accidents took place during the daylight hours. That meant that about ten people were killed each day, or nearly one every hour of daylight; nearly one every two minutes was injured, and within a fraction of every minute there was an accident to person or property. In fact, the free use of the roads was denied to a great section of the King's subjects—the old, the infirm, and children. He believed that the present condition of things could be very great alleviated. From inquiries made by the Safety-First Council it appeared that with respect to 600 fatal road accidents 100 were due to excessive speed and between 300 and 350 were due to careless or confused crossings by pedestrians. He was satisfied that in the very large portion of the latter class of accident a contributory cause was that the motorist was going so fast that when the accident became obvious he was unable to pull up. He attached great importance to the provision for altering the level of roads as a check to fast driving. The Bill further provided that every licence must show that the motorist was insured against third-party risks.

Lord DENMAN moved the rejection of the Bill. He said that the object of the measure would command general acceptance. It was to the very drastic proposals by which the Bill sought to achieve that purpose that he objected. The Bill was regarded with disfavour by the motoring public. He agreed that the penalties for dangerous driving should be far more severe than they were to-day, and that some check should be placed on the ssue of licences to people suffering from certain physical disabilities. The objection he saw to the proposal of a medical examination was the great expense that would be entailed. At first sight it might seem desirable to have a driving test, but he believed it to be the case that the independent committees which had inquired into the question had all reported against it.

After further debate,

The Marquess of LONDONDERRY (First Commissioner of Works) suggested that the Bill should be withdrawn. It had been torn to shreds and tatters in the course of the debate. He did not disagree with Lord Cecil on matters of principle, but with the methods of carrying out the suggestions that had been put forward. This was a matter to which the Government were fully alive and to which they were directing their attention.

Earl RUSSELL: You have been doing that for three years.

The Marquess of LONDONDERRY said that the Government were doing all that at the moment could be done to deal with this problem. Regulation of motor traffic was absolutely necessary, but it must be sympathetic rather than oppressive, and must not operate in any way that might hinder the development of what was a comparatively young and flourishing industry. The Government could not accept the Bill. In the first place, there was no time for it, and in the second a Royal Commission was sitting investigating the whole problem of the regulation of motor vehicles and the coördination of all forms of road transport. The provision relating to the rate of speed was retrograde in character and impracticable. Speed was by no means the greatest factor in motor street accidents. In 1926 20 per cent. of such accidents occurred at a speed of from one to five miles an hour and at a speed of over 20 miles an hour the percentage of accidents was only 4½.

After further debate,

The Marquess of SALISBURY (Lord Privy Seal) suggested that the Bill should be given a second reading on the condition that Lord Cecil should not press the matter any further, but that the Bill should be sent by the Government to the Royal Commission which could consider it and decide whether its provisions were workable or not.

Viscount CECIL said that if the noble marquess would amend his offer by saying that he would ascertain from the chairman of the Royal Commission whether he would present in a very brief period an interim report dealing with this question of the danger of the roads, he would be willing to accept it.

The Marquess of SALISBURY assented to the second reading of the Bill on the understanding that it should be referred to the Royal Commission with a view to an early report upon it, or to a Select Committee.

The motion for rejection was withdrawn, and the Bill was read a second time.

PRESERVATION OF INFANT LIFE.

TUESDAY, DEC. 18TH.

The Protection of Infant Life Bill was read the third time.

Following the third reading, Lord DARLING moved three amendments to Clause 1.

In accordance with the guillotine resolution, the question that Clause 4 stand part of the Bill was put from the Chair and agreed to without a division.

Duties of Public Assistance Committees.

On Monday, Dec. 17th, the House again went into Committee on the Local Government Bill, Captain BOURNE in the chair.

Clause 5 provides that an administrative scheme for the constitution of a public assistance committee shall be made by the county councils and county borough councils.

Mr. LANSBURY moved an amendment to delete the reference to the public assistance committee, and to provide that the scheme should provide for the delegation of the transferred functions to appropriate committees of the council.

Mr. CHAMBERLAIN, Minister of Health, in opposing the amendment, said that exactly the same ground had been covered by its supporters as on Clause 4. His answer to the amendment was exactly the same. It was not that there was any intention of encouraging local authorities to keep all the transferred functions for ever under the public assistance committees; his point was simply that it would be physically impossible to hand over at once to the appropriate committees all the varied functions which were to be transferred. A great many local authorities would be in the position of having no public hospital and only a poor-law institution. In order to make a proper scheme the new authority would have to survey all the various institutions. They could not make that survey and carry out the structural alterations necessary in a day.

Mr. SIDNEY WEBB said that the amendment which the Minister of Health would move later on would allow the London County Council to transfer to any of its committees any part of the functions which it was performing, whether they were performed under the Poor-law or under the Education or Public Health Acts. In other words, under the terms of this amendment the London County Council would be able to transfer to what was called the Public Health Committee not only the functions which it exercised under the Public Health Acts and other similar Acts, but also the functions which it exercised in regard to the sick and infirm and which could be carried out by the guardians and the education committees. All he asked was that the same freedom should be given to other larger authorities in the country, such, for example, as the town councils of Liverpool and Manchester.

The amendment was negatived.

Under the provisions of the guillotine motion, the discussion on Clauses 5 to 8 automatically came to an end at 7.30 o'clock, and Lieut.-Colonel Fremantle's amendment on the Paper providing that a public assistance committee should include persons experienced in the work of voluntary hospitals was therefore not debated. Another amendment, in the names of Sir RICHARD LUCE and Colonel FREMANTLE, providing that all matters relating to the exercise by the council of the transferred functions, except the raising of a rate or borrowing money, should stand referred to the public assistance committee, or to any other committee of the council as the council should so determine, was also passed over.

On Clause 6, which provides for the appointment of guardians' committees and subcommittees, another amendment by Colonel Fremantle was likewise cut out by the guillotine. This amendment was to the effect that the administrative scheme might provide for the appointment of joint committees of guardians' committees for county areas, either in one or more counties, and for the performance by them within the areas for which they acted of the powers conferred by the clause upon guardians' committees, or any of them.

On Clause 7, which provides that as soon as an administrative scheme has been submitted to the Minister of Health, the council submitting the scheme shall publish a notice in the local newspapers stating that the scheme has been so submitted, Dr. VERNON DAVIES had an amendment on the Paper providing that the councils should also furnish copies to the councils of the several districts wholly or partly within the county, together with copies of the notice. This amendment was also guillotined.

Disqualifications.

On Clause 9, which deals with disqualifications, Mr. SIDNEY WEBB moved an amendment providing that a person should not be disqualified from membership of the Council of a county or county borough by reason that he or a member of his family had been an inmate of any institution provided by virtue of the Lunacy or Mental Deficiency Acts. Mr. WEBB said that as the law now stood a man was a pauper if his wife or child had been taken to an asylum, and even if he had paid the cost of maintenance in that institution when it was charged to him by the guardians.

Mr. E. BROWN said that there was some doubt whether relief given for maternity and child welfare in a maternity home constituted relief under the Bill.

Mr. CHAMBERLAIN said that a maternity home, or a similar institution, was covered by the words of the clause. So far as the Mental Deficiency Acts were concerned, the point raised by Mr. WEBB was quite clear. Under the Mental Deficiency Act of 1913, while the authorities were entitled to recover a sum towards the expenses of maintenance from the individual, they had no power to recover from the guardians. Therefore treatment in a mental deficiency institution was not poor relief. It was true that a pauper lunatic who was confined in an asylum and was chargeable to the guardians was disqualified under certain circumstances, but there, again, the consideration came in as to whether the person was receiving medical or surgical relief. When legislation was introduced to deal with the recommendations of the Royal Commission on the Lunacy Laws, no doubt the Lunacy Acts would be added to the list of Acts mentioned in Clause 4 of this Bill, and there would be a provision under the terms of this Bill.

Mr. WEBB said that it was not fair to disqualify 115,000 people in the meantime before the passage of lunacy legislation when the matter could easily be set right now.

Mr. CHAMBERLAIN replied that he was not sure that the matter could be so easily set right now, but he would give it further consideration.

The amendment was withdrawn. Clause 9 was added to the Bill. Clause 10 (Repeal of the Unemployed Workman Act, 1905), Clause 11 (Amendments to certain Acts), and Clause 12 (Alteration of the Constitution of Assessment Committees) were then passed under the guillotine, and the debate was adjourned.

Roads and Bridges.

In the House of Commons two further days were allotted to the Committee stage of this Bill. The report is unavoidably held over. Most of the sitting on Wednesday, Dec. 19th, was taken up in the discussion of the clauses dealing with the powers of the local authorities over roads, bridges, and so forth. On Clause 29, which provides that an urban district council for a district for a population above 20,000 may claim to exercise the functions of maintenance and repair of any county roads within its district, Colonel ASHLEY (Minister of Transport) stated that the Minister of Health had informed him that he had in contemplation a five years' census instead of a ten years' census. By the operation of the guillotine Clause 46 (Provisions as to Medical Officers of Health); Clause 47 (Qualifications of Certain Medical Officers and Health Visitors); Clause 48 (Maternity and Child Welfare Services); Clause 49 (Notification of Births); Clause 50 (Supervision of Midwives); and Clause 51 (Provision of Hospital Accommodation for Infectious Disease) were among the clauses which were added to the Bill without discussion. During the day Clauses 29 to 53 were added to the Bill and progress was reported, and the debate adjourned till after the Christmas recess.

THE HOUSING SUBSIDY.

On Wednesday, Dec. 12th, Mr. CHAMBERLAIN (Minister of Health) moved that the draft of the Order proposed to be made by the Minister of Health and the Scottish Board of Health with the approval of the Treasury under Section 5 of the Housing (Financial Provisions) Act, 1924, be approved. He said that in December, 1926, when the last cut in the subsidy was made, he stated that he had come to the conclusion that there was a definite relation between the amount of the subsidy and the cost of building. That was borne out by figures. In July, 1921, when the decision was made to shut down the Addison scheme, the price of non-parlour houses was on the average £665. By December, 1922, the price had come down to £316 per house. In April, 1923, a new Housing Bill was introduced with a subsidy which was equivalent to about £75 per house. A month afterwards the price rose from £316 to £368, and by January, 1924, it had gone up to £386. A further Housing Bill was then introduced and there was an increased subsidy equivalent to about £160 per house. In a month the price went up by £52 to £138, and later it reached £151, an increase of £65. There it remained until December, 1926. In the March quarter after the last cut was made the price decreased by £23 to £125. Since that time it had more or less steadily fallen until in the September quarter of this year it had reached £360, a decrease of £88 per house. They made a cut in the Exchequer contribution which was equivalent to £25 per house. If they added that sum to the corresponding reduction in the contribution of the local authority, which was half the Exchequer contribution, they had a total cut of £37 10s. If they deducted that from £88, which was the fall in price of non-parlour houses, they got a net reduction of £50 10s. in the price of a house. So that local authorities to-day, after making allowance

Correspondence.

"Audi alteram partem."

TONSILLECTOMY OR GALVANO-PUNCTURE?

To the Editor of THE LANCET.

SIR,—In your issue of Dec. 8th (p. 1209) Dr. W. S. Whitcombe pleads for the use of the electric cautery in cases of tonsillar infection. I claim some experience in this subject, firstly as a general practitioner, secondly as a clinical assistant in the throat department of a general hospital, and thirdly as a victim of the cautery who was eventually brought to health by the complete dissection of his tonsils. Arguing from the particular to the general, I will deal with my personal experience first.

After a period of exposure to mustard gas in late 1917, I developed a chronic tonsillitis with frequent exacerbations and, later, starting with a mild furunculosis, I lost all resistance to staphylococci, suffering from carbuncles and abscesses of increasing severity. As I had pus oozing from the crypta magna of each tonsil I saw a throat specialist at one of the stationary hospitals behind the line. I was at the moment in a field ambulance, and as I did not wish to leave my unit for an operation, these crypts were opened up with the cautery under cocaine. I rapidly became worse, and just after the Armistice developed a double quinsy. Meanwhile the skin infection increased, and I had at least 18 abscesses in the arm-pits. I had, of course, vaccine therapy, both stock and autogenous, as well as all the reputed lines of treatment, without avail. After I was demobilised I arranged to have my tonsils out, and the operation for dissection was carried out by Mr. Somerville Hastings. It was rendered more difficult by the adhesions caused in part by the cautery and also by the quinsies; but the improvement in my general health and my feeling of well-being within 14 days of that operation was, to me, little short of miraculous, and I have maintained a comparatively robust health, with no return of the staphylococcic infection, ever since.

It is difficult not to be prejudiced in favour of the operation for the complete removal of the tonsils after such an experience, but one tries to keep an even balance of opinion in dealing with cases of tonsillar disease at hospital and in private practice. But, by choosing the cases for operation and by setting a standard of signs and symptoms, it is undoubtedly possible to claim dramatic results in the improvement of health of both children and adults, such as were claimed in the recent article referred to in Dr. Whitcombe's letter. The symptoms and pathological changes due to focal infection in the tonsils are widespread and more often than not remote from the throat. I therefore set the following local tests for deciding whether tonsillectomy should be performed or not.

1. *Congestion.*—If there is an unvarying red area from the base of the tongue up the anterior pillar of the fauces and spreading over to the uvula, causing elongation thereof, the tonsils are suspect, even if there are no throat symptoms.

2. *Presence of pus.*—If on pressure from the lowest part of the tonsils upwards, pus or hard cheesy masses of revolting smell are exuded, tonsillectomy is advisable.

3. *Glandular enlargement.*—If there is increase in the size of the tonsillar cervical glands it would appear that the first line of defence has succumbed.

4. *Size of the tonsils.*—Mere enlargement of the tonsils without any of these signs is no justification for the operation unless it causes obstruction. It is remarkable in children how the tonsil varies in size from week to week without any sign of local or general disease. In adults it is often the small fibrous tonsil that causes systemic infection.

If a case is found where all the signs are positive and the general health undermined there is no question as to the dramatic improvement in health following the operation. Not perhaps so startling as the cure of a neuralgia after the removal of a septic stump or crowned infected tooth, but sufficiently so always to justify the complete removal. The dangers and difficulties of dissection of the tonsils have been largely removed by the introduction of the Boyle Davis gag and, with proper anæsthesia, complete removal can be carried out with just as little or even less discomfort during the period of recovery as when the guillotine is used. The age of the patient does not appear to matter. I have had equally good results in a man of 68 and a child of 18 months. In both cases the recovery from the after-effects was rapid and the main symptom, intractable cough, was alleviated from the moment of operation.

It appears to me that the cautery must, in opening one or two large crypts, seal the ends of many smaller and result in a far more definitely enclosed infection; and it seems to be just as unscientific as the crowning of an infected tooth stump and as unjustifiable. Once a tooth is decayed and infected it is no longer any use, but a danger to the system. Nowadays one hears no plea for the retention of such stumps, although the teeth were placed in the body for a purpose. That purpose having failed their complete removal is logical, just as logical as is the complete removal of the tonsil and the appendix, once they succumb to infection and become no longer useful units in the human organism.—I am, Sir, yours faithfully,

C. BERKELEY WAY, M.B., B.S. Lond.

Finchley-road, N.W., Dec. 19th, 1928.

RADIUM AND CANCER.

To the Editor of THE LANCET.

SIR,—My attention has been drawn to a paragraph headed Radium and Cancer in the *Times* weekly edition (Sept. 13th, p. 279), in which Mr. T. W. Paulin is quoted as having made an interesting statement as to the desirability of the London Hospital acquiring additional radium. In the course of this statement Mr. Paulin refers to a "new technique" for the application of radium which has given most encouraging results. He writes:

"The new technique which has been in use on the continent, at Brussels in particular, for some time past, consists in inserting a number of needles containing radium all round the cancerous growth—in favourable cases the growth is not only destroyed, but is prevented from spreading to the surrounding tissues."

This is perfectly correct save for the statement that the technique referred to is new, and the inference that it was evolved on the continent. The technique was fully worked out here in Dublin, and has been in constant use for the last 13 or 14 years. The nature and theory of the technique is dealt with by myself in a paper on the Local Application of Radium in Therapeutics, which appeared in the Scientific Proceedings of the Royal Dublin Society for May, 1914 (p. 290 et seq), and evidence of its remarkable practical success appears in a paper contributed by Dr. Walter C. Stevenson to the *Dublin Journal of Medical Science* for March, 1915.

The following quotation from the latter paper shows that Dr. Stevenson was then quite cognisant of the value of boundary treatment as referred to in Mr. Paulin's statement. Dr. Stevenson is speaking of a case of cancer which, originating in malignant polypi of the nose, had, among other lesions, caused proptosis of the eye. With the object of inhibiting the growth from increasing upwards and pressing on the eyeball, he arranged a line of needles immediately under the orbit. His treatment had the desired effect. Dr. Stevenson adds: "This systematic radiation of a growing edge is only possible by the needle method, and is one of its great advantages."

It is therefore evident that in every particular the technique Mr. Paulin refers to has been in use in this City since 1914 and 1915. So far as I know it originated and received its earliest trial and publication in connexion with the work done in the Radium Institute affiliated with the Royal Dublin Society.

I am, Sir, yours faithfully,

Trinity College, Dublin, Dec. 19th, 1928. J. JOLY.

The clause in its original form provided that any person who, with intent to destroy the life of a child capable of being born alive, by any wilful act caused a child to die before it had an existence independent of its mother, should be guilty of felony, to wit, child destruction, and should be liable on conviction thereof on indictment to penal servitude for life; provided that no person should be convicted of an offence under this section if it was proved that the act which caused the death of the child was done in good faith for the purpose only of preserving the life of the mother."

Lord DARLING said that on the Committee stage it was pointed out that there were occasions in which it was necessary at the confinement of a woman, in order to save her life, that the child about to come into the world should be destroyed. He fancied that it must be very rare that that should have to be done in good faith, but it was stated that such a case might arise, and that a third person might be indicted, through having acted in good faith. That was provided by the proviso in the clause beginning with the words "provided that no person shall be convicted" and so on, but it was then pointed out that it might be said that the onus was upon the person, who would be a third person, who had destroyed the child, to prove that he acted in good faith for the purpose of saving the life of the mother. He would therefore move three amendments which would result in the onus being put on the prosecution, so that it would be necessary for the prosecution from the start to prove—or else there would be no case to go to a jury—that the person who was accused of destroying the child had not done so honestly and in good faith. His amendments would make the proviso read:—

"Provided that no persons shall be guilty of an offence under this section unless it is proved that the act which caused the death of the child was not done in good faith for the purpose only of preserving the life of the mother."

Lord PARMOOR expressed satisfaction with the amendments, which he said made it quite clear that the onus of proof was on the prosecution.

The Lord CHANCELLOR said that Lord Darling had produced the amendments, partly after consulting him, to make it quite clear that the burden of proof had been shifted. He thought that the amendments did shift the onus of proof.

The amendments were agreed to and the Bill was passed and sent to the House of Commons.

HOUSE OF COMMONS.

TUESDAY, DEC. 18TH.

Medical Examination of Seamen.

Lieut.-Commander KENWORTHY asked the President of the Board of Trade whether he was aware that the room provided at Hull for the medical examination of seamen was unsuited for such purposes; and if he would take steps, in the interest of the health of seamen, to cause proper accommodation to be provided.—Sir PHILIP CUNLIFFE-LISTER replied: Medical examinations of seamen at Hull are not carried out at the Board of Trade offices, and no accommodation is provided there for the purpose. Any examination of seamen by the medical inspector appointed under the Merchant Shipping Acts would be held at his surgery, but no application has been received for such examination for some years.

Directors of Medical Services.

Sir HERBERT CAYZER asked the Parliamentary Secretary to the Admiralty for what period the Director of Medical Services held office; whether any extension in the period of the appointment was permissible; for what period the present director had held office; and whether any extension of his appointment was proposed to be made.—Lieut.-Colonel HEADLAM (Parliamentary Secretary to the Admiralty) replied: The appointment of Medical Director-General of the Navy is normally for three years, but this period may be extended if the Board of Admiralty thinks it desirable. The present Medical Director-General was appointed on July 1st, 1927, and the question of an extension, therefore, does not yet arise.

Sir HERBERT CAYZER asked the Secretary of State for War for what period the Director of Medical Services, Royal Army Medical Corps, held office; whether any extension in the period of the appointment was permissible; for what period the present director had held office; and whether any extension of his appointment was proposed to be made.—Sir L. WORTHINGTON-EVANS replied: The appointment of Director-General, Army Medical Services, is for four years, but an extension is permissible. As the present Director-General has held office for 2¼ years only, no question of extension has arisen.

Sir HERBERT CAYZER asked the Secretary of State for Air for what period the present Director of Medical Services had held office; whether at any time an extension of his appointment had been granted; whether it was proposed to grant him an extension in the future; and, if so, to what extent this would retard the promotion of junior officers serving in this department.—Sir S. HOARE replied: The tenure of the appointment of the Director of Medical Services dates from November, 1921. An extension has recently been granted until November, 1930. The question of any further extension will be considered on its merits when necessary in the light of the circumstances then existing. The fourth part of the question does not therefore arise.

Health of the Mercantile Marine.

Lieut.-Commander KENWORTHY asked the President of the Board of Trade whether he would state the personnel of the joint standing committee which has been set up to advise the Ministry of Health and the Board of Trade on matters affecting the health of the mercantile marine.—Sir P. CUNLIFFE-LISTER replied: The personnel of the Committee is as follows: Representing the Board of Trade: Sir Charles Hipwood, chairman; Mr. G. E. Baker, Mr. A. S. Hoskin, and Mr. C. J. Ovey, clerical secretary. Representing the Ministry of Health: Sir George S. Buchanan, Dr. H. A. Macewen, Mr. M. Heseltine, Mr. R. H. Crooke, and Mr. M. T. Morgan, medical secretary.

Pulmonary Tuberculosis.

Mr. ERNEST BROWN asked the Minister of Health the number of persons suffering from pulmonary tuberculosis awaiting admission to sanatoria on the latest available date.—Sir KINGSLEY WOOD replied: Separate figures for pulmonary cases are not available, but on Dec. 1st there was a total of 2541 persons who had been awaiting residential treatment for tuberculosis from local authorities in England and Wales for more than ten days. On the same date the total number of patients receiving such treatment was in excess of 21,000.

Deaths from Gas Poisoning.

Mr. BOWERMAN asked the Home Secretary whether a record was kept of the number of deaths by suicide and accident due to gas poisoning; and, if so, would he state the number of such deaths for the years 1913 and 1927 respectively.—Sir KINGSLEY WOOD replied: The deaths referred to are distinguished in the Registrar-General's mortality statistics, and the particulars asked for are contained in the following table, which shows the number of deaths in England and Wales registered during the years 1913 and 1927, which have been classified to gaseous poisoning, distinguishing accident and suicide.

Nature of gas as stated in death registers.	1913.		1927.	
	Accident.	Suicide.	Accident.	Suicide.
Coal gas	40	130	118	994
Carbon dioxide	8	2	4	—
Carbon monoxide ..	11	4	29	—
Other, or not stated, gases, fumes, &c. ..	30	24	14	4
Totals	89	160	195	998

The numbers of deaths shown above under "Accident" include a number of cases for which "Open verdicts" were returned at inquests.

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the Committee £703 was voted to 35 applicants. The following were some of the cases helped:—

Widow, aged 54, of LL.D. and M.B. Owing to the lack of any special training is unable to earn more than £1 a week. Voted £36 in four instalments. Widow lives rent free in one room.

Daughter, aged 68, of L.R.C.S. and L.S.A. Has supported herself for 21 years, but her employer has recently died and owing to her age she cannot now find work, and is practically destitute. Only income is old age pension of £26 a year. Voted £36 in four instalments. Other charities will be asked to assist. Applicant at present living with her nephew.

Daughter, aged 66, of M.D. On death of her parents was left eldest of four children and very badly provided for. Has supported herself by teaching until her health gradually gave way at 66. Her only income is £61 a year. Fund voted £36 in four instalments.

Widow, aged 71, of M.D. Has supported herself by keeping a private school, but owing to her age she has practically lost all her pupils and is almost destitute. Income £55. Voted £36 in four instalments. Other charities are now interested in this case and will give help.

Contributions should be sent to the Hon. Treasurer at 11, Chandos-street, London, W.1.

cial explanation, but the influence of the periphery especially the immediate periphery of the fovea the fovea is now firmly established. The point nt the star is dealt with in detail in my book.

I am, Sir, yours faithfully,

ondon, Dec. 24th, 1928. F. W. EDRIDGE-GREEN.

NITROUS OXIDE.

To the Editor of THE LANCET.

IR,—I should be grateful if you would correct an r which appeared in my article on the Pneumatic e Operative Apparatus in your issue of Dec. 8th. as been pointed out to me that nitrous oxide, which ated could be used in an emergency, is as liable xygen to explode with combustible bodies such as affin, and cannot therefore be looked upon as able for use in the apparatus.

I am, Sir, yours faithfully,

arley-street, W., Dec. 19th, 1928. W. H. OGILVIE.

FECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED DEC. 15TH, 1928.

Notifications.—The following cases of infectious ease were notified during the week:—Small-pox, (last week 155), ; scarlet fever, 2504; diphtheria, 5; enteric fever, 38; pneumonia, 1248; puerperal er, 49; puerperal pyrexia, 111; cerebro-spinal er, 7; acute poliomyelitis, 3; acute polio-cephalitis, 1; encephalitis lethargica, 25; continued er, 1; dysentery, 5; ophthalmia neonatorum, 78. case of cholera, plague, or typhus fever was fied during the week.

The number of cases in the Infectious Hospitals of the tropolitan Asylums Board on Dec. 18th–19th was as lows:—Small-pox, under treatment 15; under observa-n, 1; scarlet fever, 2376; diphtheria, 2154; enteric er, 14; measles, 47; whooping-cough, 427; puerperal er, 21 (plus 9 babies); encephalitis lethargica, 73; liomyelitis, 5; "other diseases," 20. At St. Margaret's ospital there were 6 babies (plus 1 mother) with ophthalmia onatorum.

Deaths.—In the aggregate of great towns, including ondon, there was no death from small-pox, 5 (2) om enteric fever, 22 (0) from measles, 9 (2) from arlet fever, 47 (15) from whooping-cough, 42 (10) om diphtheria, 61 (16) from diarrhœa and enteritis nder two years, and 61 (9) from influenza. The gures in parentheses are those for London itself.

The fatal cases of enteric fever outside London were ported from Sheffield 2, Sunderland 1. Newcastle-on-Tyne ported 5 fatal cases of measles, Liverpool 4, Stockton-on-ees and Hull 3 each. Manchester reported 3 deaths from hooping-cough. Fatal cases of diarrhœa were reported from oke-on-Trent 5, Sheffield 4, Leicester, Nottingham, iverpool, Manchester, and Leeds 3 each (Glasgow 5, elfast 9). Manchester reported 5 deaths from influenza, iverpool and St. Helens 3 each, no other provincial town ore than 2.

he number of stillbirths registered during the week n the great towns was 263 (corresponding to a rate f 42 per thousand births), including 45 in London.

GIFTS FOR PURCHASE OF RADIUM.—Mr. William uttall has given £3000 for the purchase of radium for the eatment of cancer at Doncaster Infirmary. He has also iven £1000 to the Yorkshire Cancer Research Fund and 000 to the Leeds Radium Fund.—King Edward's Hospital und for London has received an anonymous donation of for the purchase of radium, to be used at the discretion f the Fund.

DAVYHULME HOSPITAL.—The new hospital built at avyhulme, near Manchester, by the poor-law guardians f the Barton-on-Irwell Union has now been put in com-ision, and patients from the Patricroft Institution will be aken there. The hospital provides accommodation of beds, and its total cost was £325,000, or £650 per bed, hich is regarded as remarkably low.

Medical News.

UNIVERSITY OF CAMBRIDGE.—At a congregation on Dec. 19th the degrees of M.B. and B.Chir. were conferred on M. T. Clegg, and the degree of B.Chir. on L. R. Janes.

At recent examinations the following candidates were successful:—

THIRD EXAMINATION FOR M.B. AND B.CHIR.

Part I., Surgery, Midwifery, and Gynæcology.—C. M. Barker, F. G. Booker, J. V. Broad, C. J. M. Dawkins, E. L. Edmondson, J. S. S. Fairley, W. R. Forrester Wood, J. C. Gordon, A. C. de B. Helme, C. Hill, J. H. Hopper, M. C. Hounsfield, T. A. A. Hunter, L. R. Janes, W. E. Joseph, P. G. S. Kennedy, R. W. Knowlton, O. L. Lander, J. F. V. Lart, G. E. Lewis, T. K. S. Lyle, F. H. McCay, A. D. Morton, E. J. Neill, W. G. Oakley, J. A. Pocock, W. Radcliffe, G. L. Robinson, J. W. Shackle, D. M. Stern, H. Taylor, V. Thorne Thorne, G. W. Willcox, A. W. Williams, L. K. Wills, G. N. Wood, B. Wright; A. B. Field and F. Ram, Newnham; B. M. Willmott, Girton; and K. Wilson, Newnham.

Part II., Physic, Pathology, and Pharmacology.—M. E. Albury, H. F. Bateman, C. F. Brockington, F. Bush, E. Clayton-Jones, A. J. Dix-Perkin, R. M. Dowdeswell, A. G. Eddison, W. A. Elliston, L. Foulds, C. A. Francis, J. L. Franklin, R. Gallimore, E. L. Graff, J. M. Graham, L. T. Hilliard, R. Hodkinson, S. D. Isaacs, W. E. Joseph, J. Lloyd-Williamson, A. Maberly, H. Mallinson, J. K. Moore, J. B. Murray, J. D. R. Murray, J. L. Newman, E. A. E. Palmer, L. S. Penrose, G. W. Pimblett, J. H. Richmond, G. L. Robinson, J. I. Sapwell, S. W. Savage, C. W. Shaw, W. H. Simonds, E. T. O. Slater, C. L. Stote, H. S. Taylor Young, I. C. C. Tchaperoff, W. E. Underwood, J. H. Wainwright, F. H. Ward, G. W. Willcox, L. B. Winter; M. H. D. Carr, Newnham; and J. R. Lees, Girton.

UNIVERSITY OF SHEFFIELD.—At recent examinations the following candidates were successful:—

M.D.

Denton Guest.

FINAL EXAMINATION FOR M.B., CH.B.

Part II.—Doris Butler, Dorothy Colver, and J. D. Gray.

Part I.—W. H. Carlisle, Frank Ellis, R. B. Gould, *Iris M. Moody, †T. H. Puller, Isaac Slesnick, Ethel H. Waddy, and J. H. Wilbourn.

* With distinction in forensic medicine.

† With distinction in forensic medicine and in public health.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—At a meeting of the College on Dec. 18th, with Mr. Alexander Miles, the President, in the chair, the following 31 successful candidates, out of 89 entered, who passed the requisite examinations between Sept. 27th and Oct. 8th, were admitted Fellows:—

B. Adlington, L. T. Barclay, J. A. Bingham, J. G. Bogle, N. E. H. Box, A. W. Bowles, G. W. S. Brown, E. L. Button, D. Cameron, S. Dayal, D. Fettes, H. W. Fitzgerald, J. C. Forsyth, J. A. R. M. Hadley, Constance I. Ham, Muriel G. Henderson, D. Lamont, A. Macdonald, T. G. Millar, N. Fal, S. Foy, C. D. Read, B. W. B. Riley, C. P. Robinson, G. Saint, T. B. Seed, Sudhendu Sekhor Sen, E. L. Sergeant, H. K. L. Vaidya, F. K. White, and T. V. Woods.

FRENCH CONGRESS OF DERMATOLOGY.—The fourth Congrès des Dermatologistes et Syphiligraphes de Langue Française will be held at the Hôpital Saint-Louis, Paris, from July 25th–27th, 1929, under the presidency of Prof. Sabouraud. The subjects of discussion are the Polymorphous Erythemas, the Prurigos, and Malariotherapy in the Nervous Complications of Syphilis. The secretary-general is Dr. Clement Simon, 104 avenue Malakoff, Paris, XVI.

CRITICISM OF THE LOCAL GOVERNMENT BILL.—We have received the following statement from the National Baby Week Council, 117, Piccadilly, London, W.: "The National Baby Week Council views with alarm the proposals at present before Parliament to substitute 'block' for 'percentage' grants in support of the maternity and child welfare service. This service is a young and growing one that has not yet developed so as to secure to the children of the country as a whole the benefits made possible by the Maternity and Child Welfare Act. Hitherto 50 per cent. of the net approved expenditure on maternity and child welfare work has been borne by the State. Under the new Local Government Bill a block grant in respect of social and other services (maternity and child welfare, public health, roads, &c.) will be made to the appropriate local authority which will, except for minor safeguards in the Bill, itself decide how much of it is to be spent on maternity and child welfare. The question is—will maternity and child welfare receive an adequate proportion of the block grant to allow for much needed expansion, or will local factors operate to restrict expenditure on and hinder the progress of this vital work? The National Baby Week Council at its last meeting passed a resolution expressing its apprehension of the proposed change."

PURE NEPHROSIS.

To the Editor of THE LANCET.

SIR,—Everybody will agree with the terminal statement in Dr. Parkes Weber's letter that "in such matters mechanical explanations are not to be lightly accepted." Although Dr. Weber himself admits mechanical factors as playing at least a part in this disease—believing that the swelling of the epithelium of the convoluted tubules is sufficient to partially obstruct the outflow of water from the glomeruli—I fear that this statement may convince more than ever of the correctness of their attitude those who believe that most of the ills of the kidney and certainly pure nephrosis are due to some poison; and that it will thus prevent them giving such consideration to mechanical explanations as the subject deserves.

One has to remember that in spite of the wonderful chemical reactions which take place in the body, of the play of hormones and of internal secretions, man is a high-pressure machine; and that most if not all of the chemical changes only take place in virtue of man being a high-pressure machine. We have recently celebrated the Harvey tercentenary, we have seen the Harvey film, and Lenotre [1] has shown us the quagmire formed by the blood of victims round the scaffold during the Terror—how the blood pours out when the head is cut off. And it is not simply to make the blood go round and round that a high aortic pressure exists; it is to make the organs work that a high blood pressure is necessary. Especially do we know from Goll's experiments (1854) that a high blood pressure is necessary for renal activity; when the blood pressure is reduced the kidney fails to work, when the blood pressure is raised, the kidney works more efficiently. Certain physical conditions thus seem necessary for the maintenance of the normal. Is it to be believed that change of physical conditions cannot produce the abnormal? In every walk of life the environment (mainly of physical effect) shapes the individual; in every walk of life the internal pressure conditions determine health or disease.

Unfortunately, pathology—especially the pathology of renal disease—is all befogged because the complete mechanism (chemical and physical) of the normal is not yet known; the exact mechanism of the secretion of urine has not yet been certainly displayed. And since microbic invasion causes many diseases, since microbes obtained from the diseased part can now be seen—whilst physical forces are abstruse and cannot be seen (only their effects can be seen)—it is imagined that all visceral disease must be due to microbes or the toxins they produce or to kindred poisons, except indeed those in which some mechanical feature is so obvious that it cannot help obtruding itself on the consciousness of the observer. So grossly inclined to toxic processes is thought of to-day that it is safe to say that any pathological process due to a mechanical cause would not be ascribed to that cause unless the cause were manifestly evident. To-day, even in intestinal obstruction the toxæmia which arises is imputed to absorption of toxins from the gut; not to the reaction of the individual to the obstruction (a reaction mainly physical)—as though by injecting suitable antitoxins the toxæmia would be overcome and the patient presumably would feel well in spite of the persistence of the obstruction.

And, as regards the kidney, is it not amazing that so-called pure nephrosis should be attributed to such highly different poisons as microbic toxins on the one hand, and to non-microbic poisons, such as chloroform on the other. In 1909 Dr. Parkes Weber published a case of necrosis of the convoluted tubules found at autopsy in a man the subject of malignant disease of the prostate; anuria developed, the right kidney was incised, but the anæsthetic used is not stated.[2] The case simulated the suppression of urine at times following labour—a condition imputed to toxin specific of pregnancy. And in 1921 he published another interesting case—that of a woman who was jaundiced; the gall-bladder was excised under anæsthesia; the patient died in three days and the post-mortem acute necrotic changes were found in the liver and in the convoluted tubules of the kidneys—reminding one again of the condition of these organs in the "toxæmia of pregnancy." Of these were cases in which the renal changes of eclampsia were found in the non-pregnant—the renal changes in the first case differed from those usually found in eclampsia, it was only in a few "more or less all" of the convoluted tubules (of the left kidney) having undergone a necrotic change.

It seems to me strange to impute the renal lesions of eclampsia to a toxin specific of pregnancy, the same renal lesions in another case to a microbic toxin), the same renal lesions in a third case to chloroform (because the patient has had an anæsthetic), and the same renal lesions in a fourth case to ether (because chloroform was not used). Especially is this so when it is manifest that in all these cases physical factors have been in play (and in the case of these types have been displayed with certainty), and when, moreover, we know that emptying the bladder rapidly in an elderly man with an enlarged prostate without an anæsthetic may produce a nephrosis at least an anuria. The man with an enlarged postate, unable to pass water, developed high blood pressure and strains incessantly; the woman with the excised gall-bladder developed vomited persistently; the primigravida rules the house with an activity surpassing that of the men, still are maids. Are these factors sufficient to produce pathological changes in the kidneys—even to "nephrosis"? I am certain they are.

We are told not to accept mechanical explanations lightly. I agree, but this does not mean that mechanical explanations are to be considered lightly. The evidence indicates that mechanical explanations are worthy of the greatest consideration—that mechanical factors may not only play a part in the pathological process when it has begun, but may even be the very cause of its beginning, difficult to define, more subtle in their play than the effect of microbial or non-microbial poisons. A understanding of the physics of the kidney through the kidney may not only illuminate the mechanism of the normal functioning of the kidney—the secretion of urine; it may even shed light on the rise of renal disease—the excretion of urine obviously abnormal, or even to our astonishment that puzzling condition, "no urine at all."

I am, Sir, yours faithfully,

R. H. PARAMORE, F.R.C.

Rugby, Dec. 22nd, 1928.

[1] Lenotre, G.: La Guillotine pendant la Révolution.

[2] Parkes Weber: Anuria with Necrosis of the Renal Convoluted Tubules, THE LANCET, 1909, i., 601.

THE RODS AND CONES.

To the Editor of THE LANCET.

SIR,—Mr. Wohlgemuth does not seem to read my letter very carefully. Emphatic approval mean absence of discussion; as a matter of fact was considerable discussion but every speaker supported my theory. Prof. A. v. Tschermak, one of the leading authorities on vision in stated that there was not a single fact or in my paper that he could not support from observations and he subsequently addressed letter[4] supporting my views. It is curious Wohlgemuth should have selected an exp my book of 1891 when he could have matter so much better dealt with in my "Physiology of Vision."[5] The expl gives is admitted in the book he me

[3] Parkes Weber: Case of Intrahepatic Cholell Acute Necrotic Changes in the Liver and Rena Tubules following Ether Anæsthesia, Clinic March 16th, 1921.

[4] THE LANCET, 1909, ii.

[5] Bell and Sons, 1920.

Notes, Comments, and Abstracts.

THE CONCEPT OF PREDISPOSITION

By Julius Báron, M.D. Budapest.

THE last decade may justly be called the period of naissance of the theory of constitution and predisposition. great deal has been done in a short time to substantiate e theory, but the practical results of these efforts are at esent of little significance to the practitioner, because the any new ideas are not clearly defined and so their application s led to faulty or contradictory results. On the other hand, tle would be gained by their exact definition, for concepts n only be accurately defined when their content has been arly set out. The definition is just the summary of the alyses of the concept in question, and a very large number analyses are still necessary in order accurately to define nstitution and predisposition. The present paper is a ntribution to this work.

The Accepted View.

As a starting-point let us choose a statement to criticise. his statement has not been made elsewhere, at any rate its present form, but it can be regarded as the generally cepted view of predisposition. "Two healthy individuals e exposed to the same external conditions and one falls ill, hile the other does not. We say that the sick person has a eater *predisposition* to the malady than the healthy one." On analysing this statement, our attention is arrested by e expression "*to the same external conditions.*" It is vious that no two individuals can be exposed to the same nditions in a mathematical sense. Let us, however, ard it as possible, and then disregard the conditions hich we do not consider important for the development of e illness. Which these are we must decide on the basis experience. The train of thought is somewhat as follows: e know from experience that, as a rule, no more persons ll ill of typhoid on a Tuesday than on a Friday—so that e day of the week is of no importance in the onset of the ease. Therefore experience can influence our results in mparing the predisposition of two individuals to the same alady. An alteration in our experience can, in the same ay, bring about a change in the result of the comparison. The expressions "remaining well" and "falling ill" ust also be examined more closely. It is a constantly iterated fact that there is no strict line of demarcation etween "being ill" and "being well." Such a line can lly be arbitrary. The following possibilities remain. he boundary between illness and health can, for a given ease, be drawn arbitrarily in two places; if it is drawn the first A remains well while B falls ill, and if it is drawn the second B remains well and A falls ill. The arbitrary oundary between health and sickness is, therefore, the eciding factor in comparing the predisposition of the two dividuals.

We must consider also another possibility. A and B e exposed to the same external conditions, which we will all K_1. A is taken ill and B remains well, so that the redisposition to the disease is greater in A than in B. et us assume that A and B are exposed to the conditions and B falls ill while A remains well. If the view of redisposition is to retain the meaning described in our atement, we must assume that such contradictory conditions as K_1 and K_2 are not possible. The possibility of such nditions is, however, quite an open question, and we even ard it as very probable.

A Mechanical Analogy.

Finally, let us discuss whether we are justified, when vestigating the cause of an illness, in separating the external nditions from the predisposition, "internal conditions," d setting them in opposition to one another. We can row some light on this question by an analogy. Instead a healthy individual, let us examine a well-defined echanical system. As analogies for illness and health let admit two well-defined possibilities of alteration in the stem under certain external conditions. As both external d internal conditions can be easily reviewed the conception predisposition can be studied especially well in this case. Let us imagine a homogeneous, accurately proportioned and rigid die, with three sides painted white and three black. We place the die accurately on a certain point of a strong tting and, having compressed the latter to a given degree, ase it in a prearranged manner so that the die falls on relatively large, rigid, and perfectly horizontal surface. There are two possibilities; the uppermost surface of the die is either white or black. If we repeat the experiment equently under the same conditions we can easily convince ourselves that the possibilities of the two cases are equal. We cannot foretell the result of any one experiment, even with our knowledge of the various internal and external conditions. If we take two absolutely similar dice, and assume that in an experiment the one shows black and the other white, we must assume, according to our hypothesis, a greater predisposition for black in the first die and a corresponding predisposition for white in the second. It is clear that, in this case, the conception of predisposition has been wrongly applied. If we reflect how it is possible for the experiment to lead to various results, under the same external and internal conditions, then we see that the mistake lies in the abstract conception of "the same conditions." In this case we cannot know whether some apparently quite insignificant factor did not have a decisive influence on the result. Mathematically speaking, identical conditions cannot be produced, and the result varies according to numerous extremely insignificant variations which we neglect in reproducing "the same conditions" and which, even when they can be easily studied, can never be calculated. They are summarised in the concept of "chance." Let us now imagine that inside the die, near one of the white surfaces and opposite a black surface, is a small body of great density. This transfers the centre of gravity from the geometrical centre towards the white surface. In this case a "black" results more frequently than a "white," and one can logically assert that the die is more predisposed to "black" than to "white" and has a greater predisposition to "black" than the first die. Yet it is very possible that if one experiment only is made with both dice the die with "black" predisposition might turn up white, and vice versa.

We have confined ourselves so far to a system of which the internal conditions have remained unchanged throughout the experiments. The patient who has convalesced, on the other hand, often shows an altered predisposition to the disease. In order, therefore, to complete our analogy, let us imagine that part of the interior of the die is semi-liquid and that the small body is suspended in this part, but is not moved by gravity alone. Now, the centre of gravity alters its position during the course of a single experiment. If we look at the die from the outside only we cannot determine its predisposition, even by experiment. If we assume that the position of the heavy body only alters markedly after the completion of the experiment, then we can express an opinion on the predisposition of the die, but only after an autopsy (i.e., opening the die or X raying it) can we be sure of our statements. Given a number of such dice, in which the small heavy body can take up any position, and excluding autopsy, one could only speak of a predisposition if certain external easily determinable qualities were present in combination with definite types of predisposition. The occurrence of such combinations could be determined along statistical lines.

Conclusions.

One can only speak of a greater or lesser predisposition to a given illness when definite, easily determinable qualities occur in conjunction with a greater or lesser frequency of the illness, the qualities being determinable either through the experience that they are necessary or merely by statistical methods.

Given the same external conditions, the assumption of a greater predisposition on the part of the sick person only leads to a confusion of the idea of predisposition.

PERIODICITY IN DISEASE PREVALENCE.

At a meeting of the Royal Statistical Society held on Dec. 18th Mr. H. E. Soper, of the National Institute for Medical Research, discussed the interpretation of periodicity in disease prevalence. The fact that epidemic diseases often come upon us in the manner of surges, attended with great inconvenience and fraught with many special dangers when at their height, should be sufficient incentive, he thought, for a close study of the fluctuations in disease prevalence, and many attempts to account for the periodic nature of the visitations of sickness have from time to time been made. Amongst the various theories put forward to account for epidemic recurrence, perhaps the most favoured theory presents a picture of a rise and fall in the new cases of a contagious disease as consequent upon a glut and dearth of susceptible persons; for, clearly, if there is a limit to the numbers who can contract the disease, the action may be supposed to go after the manner of a pendulum, where, as the energy of flow becomes exhausted, the energy of potential activity gets stored up, to be released again when motion recommences. The stored energy is the accumulation of susceptible children, by birth. By means of arithmetic and algebra a simple supposition in regard to the delayed or lapsing infectivity of an infected person, combined with a supposition of a constant inflow by birth of susceptible children, can be shown to lead to an ever-sustained periodic wave, or swing of the epidemic pendulum, whose period could be interpreted. These idealised waves do not, however, give a very true replica of the curve of

WE regret to announce the death of Dr. Dawson Fyers Duckworth Turner, F.R.S. Edin., hon. consulting physician in radiology to the Royal Infirmary, Edinburgh. He died at Godalming on Dec. 25th, as the result of X ray dermatitis, in his seventy-second year.

INTERNATIONAL POST-GRADUATE COURSES IN BERLIN.—A number of medical courses have been arranged for post-graduates, and there will be a special series in March and April, the subjects including cardiology, urology, surgery of breast and stomach, and radiology. The information bureau of the Kaiserin Friedrich-Haus, Luisenplatz 2–4, Berlin, N.W. 6, will send further particulars on request, and is able to arrange attendance at clinics and assist in procuring lodgings for those who need them.

HEREFORDSHIRE GENERAL HOSPITAL.—This institution is to be enlarged from 110 to 140 beds at a cost of £60,000. The money in hand for the purpose is about £23,000, but the Court of Chancery has yet to decide whether there is power to sell sufficient securities to make up the balance.

DONATIONS AND BEQUESTS.—Mr. Walter George Nicol, of 5, Lansdowne-place, Brunswick-square, London, W.C., who left estate of the value of £112,091, left over £13,000 in various bequests, and the residue of the property equally between the London Hospital and King Edward's Hospital Fund for London, expressing the desire that the governing body of the London Hospital (if it should think fit) should associate the name of Nicol with some work or object upon or for which the said share of the residue or some part thereof may be expended.—Mr. James Porter, of West Park House, Leslie, Fife, left £1000 to the Edinburgh Royal Infirmary and £500 to the Kirkcaldy Cottage Hospital.—The Manchester Royal Infirmary has received a legacy of £1200 from the late Mr. George Whitaker, and an anonymous gift of £200.—Alderman J. Foster Clark, of Maidstone, and Mrs. Foster Clark have promised a joint contribution of £30,000 towards a proposed extension of the West Kent General Hospital at Maidstone.—Sir Charles Sissmore Tomes, F.R.S., of Mannington Hall, Norfolk, and Wigmore-street, W., left £208,899. Subject to certain provisions he left his property upon trust for his daughter. In the event of his daughter leaving no issue he gave £2000 to the Royal College of Surgeons of England for the foundation of a Research Fellowship in Odontology, "in the widest sense of the word," or in the augmentation of the Sir John Tomes Prize, as the Council of that body may see fit; and £1000 each to the Norfolk and Norwich Hospital, the Middlesex Hospital, the Royal Dental Hospital, the Royal Medical Benevolent Fund, and the British Dental Association Benevolent Fund.—Mrs. Emily Harris Hollingsworth, Sutton Coldfield, left £1250 to the General Hospital, Birmingham, to endow a bed in memory of her husband.—The King has sent contributions amounting to £3510 to local charities from the Windsor Castle State Apartments Fund. Of this the King Edward VII. Hospital receives £1202.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.

MONDAY, Dec. 31st, 1928.—1.30 P.M.: Methods of Examination and Diagnosis Courses—The Ear.

WEDNESDAY, Jan. 2nd, 1929.—1.30 P.M.: The Nose.

Appointments.

BLACKWOOD, MARGARET, W., M.B., Ch.B. Glasg., has been appointed Medical Officer of Health, Barnsley.

CUNNINGHAM, Lieut.-Colonel JOHN, I.M.S., Medical Superintendent of the Astley Ainslie Institution, Edinburgh.

DAVIES, I. G., L.R.C.P. Lond., M.R.C.S., Resident Assistant Medical Officer, St. Peter's Hospital.

ROE, G. C. F., L.R.C.P & S., Irel., Medical Officer of Health, Halifax.

Queen Charlotte's Maternity Hospital: COX, A. RAYMOND, L.R.C.P., M.R.C.S., Senior Resident Medical Officer; STEVENS, I.H., M.D., M.R.C.P. Lond., Assistant Re Medical Officer; and STUART-HARRIS, KATH L.R.C.P. Lond., M.R.C.S., District Resident M Officer.

Certifying Surgeons under the Factory and Workshop REID, J., M.B., Ch.B. Glasg J. H., M.B., Ch.B. Edin. GREEN, S. M., M.R.C.S., L.R.C.P. Lond. (Prescot, Lan

Vacancies.

For further information refer to the advertisement colum

Barbados General Hospital.—Jun. Res. S. £250.
Bermond ber. O. £600.
Blackbu sst. M.O.H. £600.
Cancer *S.W.*—Radium Officer. Also Asst. S.
Central London Ophthalmic Hospital, Judd-street, St. Pa W.C.—Sen. and Jun. H.S.'s. At rate of £120 and respectively.
Cheddleton Leek, Staffordshire Mental Hospital.—2nd Asst. £650.
City of London Hospital for Diseases of the Heart, &c., Fi Park, E.—H.P. At rate of £100.
Deptford Metropolitan Borough.—M.O.H. £1100.
Freemasons Hospital and Nursing Home, 237, Fulham-Chelsea, S.W.—Res. M.O. At rate of £250.
Golden-square, Throat, Nose and Ear Hospital, W.—Hon. Sur
Hospital for Consumption and Diseases of the Chest, Bro S.W.—H.P. £50.
Hospital for Sick Children, Great Ormond-street, W.C.—Res. Supt. £300. Also Anæsthetist. 15 gns.
Hull, Infectious Diseases Hospital.—Res. M.O. £550.
Hull, Royal Infirmary.—H.S. At rate of £150.
Leamington, Warwickshire and Coventry Joint Committe Tuberculosis.—Asst. Tuber. O. £650.
London Female Lock Hospital, 283, Harrow-road, W.— £150.
Manchester, Ancoats Hospital.—Asst. Surg. O. 10s. 6d.
en-square, W.C.—Res. M.O. £200.
Hospital.—Res. H.S. At rate of £15
Orthopædic Hospital, &c.—H.S. £200.
con and East Cornwall Hospital.— H.S. At rate of £150 and £100 respecti
Preston and County of Lancaster Royal Infirmary.—H.S.
Princess Louise Kensington Hospital for Children, N. Kensin Hon. Asst. P.
Royal Air Force Medical Service.—Commissions.
Royal Army Medical Corps.—Twenty-five Commissions.
Royal Free Hospital, Gray's Inn-road, W.C.—Asst. M.O.
St. Thomas's Hospital.—Obst. P. Also Obst. P. in Ch of Out-patients.
Sheffield, Royal Infirmary.—Hon. Surgeon to Ear, Nose Throat Department.
Sudan Medical Service.—M.O. LE.780.
Swansea County Borough.—Asst. M.O. £600.
Victoria Hospital for Children, Tite-street, Chelsea, S.W.— Also H.S. Each at rate of £100.
Wandsworth Metropolitan Borough.—Asst. Tuberculosis Of £500.
West London Hospital, Hammersmith-road, W.—Aural Ophth. H.S. and Res. Asst. Cas. O. At rate of £100.
Willesden General Hospital, Harlesden-road, N.W.—Res. At rate of £100.

Births, Marriages, and Death

BIRTHS.

ADDISON.—On Dec. 15th, at Warwick-avenue, W., the wi Dr. G. M. Addison, of a son, who lived only a few ho

GOUGH.—On Dec. 16th, at 37, South-street, Chichester, Phyllis (née McBride), wife of Dr. J. H. Harley Gou a daughter.

RICHARDSON.—On Dec. 16th, at Frant-road, Tunbridge We the wife of Philip L. Richardson, M.B., B.S., of a daugh

DEATHS.

DEAS.—On Dec. 15th, at Trevarna, Budleigh Salterton, De P. Maury Deas, M.B., M.S. Lond., late Medical Supe tendent, Parkside, Macclesfield, and Wonford Ho Exeter, aged 86.

FORSTER.—On Dec. 16th, at Fairlight, Parkwood-road, Bou mouth, Frederick Cecil Forster, M.R.C.S., L.R.C.P. Lond.

GILES.—On Dec. 19th, at his residence, Earl's-avenue, Fo stone, Peter Broome Giles, C.B., F.R.C.S.

LEWIS.—On Dec. 15th, at Belvedere-terrace, Brighton, Ge Herbert Lewis, M.D., aged 52.

TUNNICLIFFE.—On Dec. 15th, at his residence, Harley-street, Francis Whittaker Tunnicliffe, M.D.

WHITLA.—On Dec. 16th, James Alexander Whitla, L.R.C.P. & Edin.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices Births, Marriages, and Deaths.